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THE most interesting event of the week to architects and builders seems to have been the arraignment of Buddensiek, the New York contractor, whose block of eight houses fell down the other day, on a charge of manslaughter. Fortunately, perhaps, for the public, one of the men injured in the catastrophe died a day or two afterward, and, as the prosecuting attorney said, this occurrence so "simplified matters," by enabling him to define the crime for which the builder was to be held to answer, that he only hesitated whether to complain of the culprit for simple manslaughter or for murder in the first degree, under that clause in the official definition of murder in the first degree which includes under it "the causing of death by an act imminently dangerous to others, and evincing a depraved mind, regardless of human life, although without a premeditated design to effect the death of any individual." In point of fact, this definition of murder very well describes the doings of Mr. Buddensiek for the past few years; but the attorney, probably concluding on reflection that he was hardly likely to get a conviction on a capital charge, decided to prosecute only for manslaughter in the second degree, so that the contractor will, for the present at least, escape being hung by the sheriff for his misdeeds, although, as the penalty for the crime of which he is now accused is fifteen years in the State prison, his mischievous activity will, if he is convicted, be checked for a while.

FROM the official records, which the zealous New York reporters have hunted up, it appears that Buddensiek has built, either in his own name, or in that of his clerks and teamsters, whom he puts forward to cover himself from official interference, more than fifteen hundred houses in New York within ten or twelve years. Most, if not all of them, have been of the common type of New York houses, with handsome cut-stone fronts and showy inside finish, and nearly all, with the exception of a dozen or more, which fell down before they were finished, have been sold at remunerative prices; but their construction has rendered them famous, from the time that Mr. Buddensiek first appeared as a builder in the city, for their bold and ingenious defiance of the laws of stability, permanence and health. Within the last five years alone one hundred and thirty-five official complaints have been entered upon the records of the Building Bureau against Mr. Buddensiek or his representatives, for all sorts of violations of the building law, and eighteen suits have at various times been brought against him, in his own name, by the Board of Health, for persistent neglect of its remonstrances and orders. A few years ago, he was arrested and tried for having put drains in the cellars of some of his houses with nothing in the joints, so that the filth ran out and saturated the cellar-floors, but, although it was proved that the occupants of the houses had had typhoid fever and diphtheria, and that one of them had died, he escaped punishment. So successful have his speculations been that it is suggested that an important influence in his favor in the present case will be exerted by the persons, probably at least ten thousand in number, who own or live in houses built by him, and will endeavor to hush up proceedings tending to discredit the property in which they are interested. Of late years, as it appears, he has employed his peculiar talent, together with his surplus earnings, in a field which of all others must be the most congenial to him, that of building seashore houses and hotels. Of the former he now owns a large village, at a new place near Long Branch, and of the latter he did own one at the same place, until it burned down last autumn, the guests escaping pell-mell in their night-clothes. His ingenuity in evading the law has been hardly less conspicuous than his genius for economical construction, and by putting the title to his land in the name of one fictitious or irresponsible person, and carrying on his operations upon it in the name of another of the same kind, he has been able to keep the agents of the Board of Health and the Building Bureau employed in long and fruitless searches after the individuals whom the law compels them to attack, while he continued unmolested the criminal acts for which every one knew him to be really, though not technically responsible.

AS a result, perhaps, of the impulse given to popular feeling by the Buddensiek case, the Daly Building Act, which has been pending before the Legislature in some form for nearly two years, passed the New York Senate, and will probably be pressed through the Assembly without delay. This law, which was drawn up by representatives of the real-estate owners and dealers, insurance managers, and builders, aided by the late Inspector of Buildings, who devoted himself most earnestly to the work, is a great advance upon the present statute, good as this is, and will, if passed, make building in New York both easier and better than it now is, modifying, as it does, some of the rather unreasonable, or at least, inelastic provisions of the present Act, and adding others, such as those for the protection of the public in theatres, and one requiring that all buildings more than seventy feet high shall be fire-proof throughout, which would alone, in course of time, make some of the worst calamities due to bad building impossible in New York.

A MYSTERIOUS affliction has fallen upon the occupants of the building known as the Soncy Flats, on West Fifty-seventh Street, in New York, in the shape of unaccountable explosions, which occur once or twice a day, and are violent enough to shake articles off the mantels, but seem to have no other unpleasant result, and cannot be explained on any ordinary theory. The explosions began a month ago or more, and were attributed to water in the heating pipes, but an examination of these showed nothing out of the way, and the noises gradually ceased, to recommence a few days ago, with as much violence as ever. The explosions are confined to the three upper stories, and are not heard in the basement, this circumstance going to show that they cannot be in the steam-pipes, as the metal of the pipes would certainly carry such a noise all over the building. A more probable source of the vibrations is, perhaps, to be sought in the blasting operations which have for some time been going on at a little distance, but the occupants of the rooms assert that there is no connection between the two phenomena. If we might hazard a guess at the cause of the noises, supposing that they do not proceed from the blasting, we should be inclined to lay them to the effect of contraction or expansion in some metal, perhaps in steam or water pipes, or possibly in the roofing. Every one who has listened to the sound of the nails in wooden houses contracting in very cold weather, and drawing out of the timber with a sharp noise, will understand the way in which an elastic substance like metal may, if held by any means, pull itself away with a sudden shock; and it is just possible that some pipe in the building may be so fixed in place that any variation in its length produces a strain, and subsequent sudden release, which shakes the surrounding parts of the structure.

A RATHER hollow ceremony took place the other day at a little town on Long Island, where a huge church, built with the money of a person so rich that the gift involved no sacrifice, in a place which is now principally known as the scene of a great, but unsuccessful land speculation, was dedicated to the service of the Christian religion. Unfortunately, the congregation which can now be collected in the town is a small one, while the church is not only very large, but is supplied with a thirty-horse-power steam-engine to assist in the music, an organ which cost a hundred thousand dollars, an "elegant mausoleum" which cost a hundred and fifty thousand

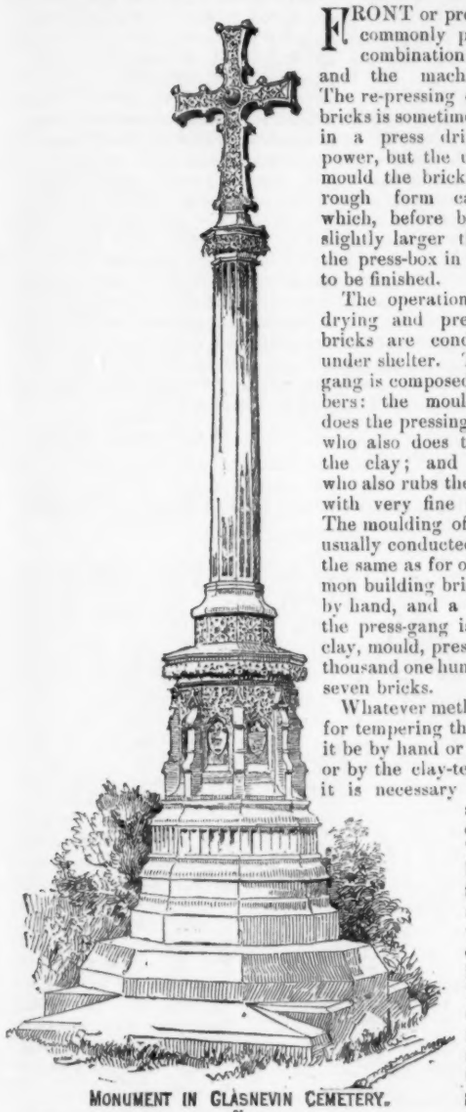
dollars, stained-glass windows from London which cost a great many more thousand dollars, and "rich marbles, fine wood-carvings and brass-work" without end, and as it would naturally be a waste to throw the enjoyment of all these expensive luxuries away on a few people, steps have been taken, as we are told, not only for running cheap excursion trains from New York and Brooklyn to the services, but for giving the church an ecclesiastical attraction by constituting it a cathedral for the diocese of Long Island. Fortunately, the diocese of Long Island is poor, and quite unable to maintain a cathedral, even if it were so injudicious as to want one ten or twelve miles from the place where most of the members of the church live, and as for the congregation, we should be sorry to think that even excursion trains would tempt a single member of the smallest and poorest Episcopal church in New York or Brooklyn to desert it for all the glories of the elegant mausoleum and the thirty-horse-power engine, and if the self-named cathedral should have to content itself, for many years, whether the excursion trains run or not, with being the scene of the devotions only of the villagers, and of a few staring strangers, we do not know that either the church or the public need to feel much regret.

IT is only a few days since some one made public complaint that New York had no flower-market, like those which render the neighborhood of Covent Garden in London, and the great Boulevards in Paris, so attractive during the greater part of the year. It is true that vast quantities of flowers are sold in New York, but the business is scattered among a great number of florists and itinerant venders, most of whom probably lose considerable sums by the fading of their perishable goods which might be saved if their resources could be better concentrated. In London, where the Covent Garden quotations for rosebuds and violets are reported as regularly as the prices of wheat in Mark Lane, there is little more to be done, but in Paris it has long been thought desirable that better facilities for the pretty traffic should be provided, and a concession was granted not long ago for erecting on the sidewalk beside the Madeleine a sort of portable market-shed which would be admirably adapted to the wants of New York. The shed, or rather shelter, is supported by iron posts, for which gas-pipes would serve very well, put in permanent iron sockets, set in the asphalt of the sidewalks, and fixed by means of a key. Two rows of posts run along the sidewalk, those in one row being a little longer than the others. Each post has a socket at the top, and in these are laid longitudinal and transverse pieces of wood, over which is spread an oiled canvas covering. The wooden rafters are held in the sockets by pins, and the cloth covering is secured in the simplest manner. Nothing more is needed but to set benches and tables for the flower-merchants, who can display their goods to the best advantage, out of reach of the hot sun; and the whole affair can be taken down and carried away in a few minutes, if necessary. There are many places in New York, such as Twenty-third Street, or Madison or Union Square, where there is room enough for a market of this kind which might easily be made one of the principal attractions of the city.

A REMARKABLE example of a successful attempt to interest workmen in the business which they help to carry on is to be found, according to *La Semaine des Constructeurs*, in a certain great paper manufactory, that of M. Laroche-Joubert, at Angoulême. In this establishment a system has for some years been pursued by which the operatives participate in the profits of the business in a manner depending somewhat on their skill as well as their industry. To give what is certainly a very reasonable advantage to the intelligence which every workman should be encouraged to cultivate, the operatives are divided into classes, according to the sort of work on which they are engaged, and a standard is established for each class, showing the proportions in which intelligence, manual exertion and the use of capital enter into the value of the articles produced by that class. At the end of the year the profit of the business for the year is ascertained, and the whole sum divided into three parts, one of which is assigned as the reward of intelligence, one of labor, and the third as the compensation for the use of capital. The share of each workman is then computed, according to the scale of the class to which he belongs, and is paid to him in cash. If any wish, they are allowed to return the money, to be invested in the business, receiving what we should call a certificate of stock in exchange, and of course secure, in addition to their other income, their share in the portion of profit allotted to capital. Those who, like many that we know, believe the average workman to be incapable of prudence or economy, and little disposed to take advantage of such opportunities to invest his savings, will do well to note that in this case the operatives have so far availed themselves of the privilege of participating in the business that out of one million four hundred and seventy thousand dollars, the present capital of the firm, the operatives in the establishment hold one million one hundred and ninety thousand, or nearly four-fifths. If we suppose the share of profits assigned to intelligence, labor and capital to be equal, about which we are not informed, the operatives thus, in addition to their regular wages, receive fourteen-fifteenths of the entire proceeds of the business; the principals of the house, who carry on its affairs, with the consent of the small stockholders, just as if they were the sole parties interested, contenting themselves with the remaining fifteenth. In some respects this is certainly the most promising example of a coöperative industry yet described. Without the somewhat artificial methods in use at Guise, the same result, of gradually admitting those employed in a great manufacturing establishment to ownership and final control, is attained. That this is better than the simple division of a portion of the profits among the men is evident. Such division of profits, without the assumption of a corresponding risk by the workmen, is generally felt both by employers and employed as a charity, often irksome to the former, and not particularly beneficial, as a mode of encouraging independence and character, to the latter; but the assumption by the operatives, as in the case of the Laroche-Joubert house, of four-fifths of the risk of the business, as well as of the profit, puts all those concerned in it on an equality, and gives them a common, or rather a mutual interest, which has a great moral value.

A RATHER important case was decided in England the other day, which is likely to serve, as English cases often do, as a precedent for the guidance of courts in this country; and as the circumstances which led to the dispute before the court are very likely to be repeated in country and suburban towns everywhere, those who inhabit such places will do well to make a note of the limit which the law seems inclined to put upon their liberties. In the case in question, which is known as Ballard *vs.* Tomlinson, the defendant, like so many other people not yet defendants, utilized, as he supposed, an old well, by converting it into a cesspool. As it happened, the subterranean stream which had supplied the old well also supplied, farther down in its course, the well of the plaintiff, who soon found himself drinking the diluted drainage from his neighbor's establishment, in place of the clear spring water to which he was accustomed. In default of other means, he betook himself to the law to obtain redress, but was repulsed with the decision that no person could claim property in an underground stream flowing beneath his land, in such a way as to prevent persons farther up the stream from draining it away, or diverting it, or making such use of it as they might choose. This judgment, which certainly seems open to the criticism that it would allow a person greater liberties with an underground stream than with one on the surface, did not satisfy the plaintiff, and he took his case to the Court of Appeal, which reversed the previous decision, and laid down what is now the common law of England on the subject, that although the owner of an estate may not be entitled to prevent the proprietor of an adjoining one, higher up than his, from draining his land in such a way as to intercept the subterranean streams which would otherwise reach the territory at a lower level, yet the owner of the lower tract has the right to demand, if the underground streams reach him at all, that they shall come to him unpolluted; and the higher proprietor is not to be permitted to dispose of noxious matters, even on his own land, in such a way as to contaminate his neighbor's spring. On general grounds, no one could object to so reasonable a decision, but an attempt to put the law in practice in some of our suburban towns or seashore settlements, in which, according to the official reports, the greater part of the wells receive sewage from the neighboring cesspools or vaults, would, we imagine, keep all the lawyers in the place busy for a long time. The subject is, however, of so great importance that it would be well worth while for a number of persons aggrieved in this way by inconsiderate or indifferent neighbors to join in prosecuting to final decision a single test case, by means of which the rights of all could be established, and relief secured for each one.

PRESSED AND ORNAMENTAL BRICKS.



MONUMENT IN GLASNEVIN CEMETERY,
OF
THOMAS HENRY BURKE, UNDER SECRETARY FOR IRELAND.
(Assassinated in Phœnix Park, in May 1882.)
THOMAS DEANE, R.H.A., ARCHITECT.

FRONT or pressed-bricks are commonly produced by a combination of the hand and the machine processes. The re-pressing of this class of bricks is sometimes accomplished in a press driven by steam-power, but the usual way is to mould the bricks by hand in a rough form called "gluts," which, before being dried, are slightly larger than the size of the press-box in which they are to be finished.

The operations of moulding, drying and pressing of front bricks are conducted entirely under shelter. The hand-press gang is composed of three members: the moulder, who also does the pressing; the temperer, who also does the wheeling of the clay; and the off-bearer, who also rubs the finished bricks with very fine moulding sand. The moulding of front bricks is usually conducted by task work, the same as for ordinary or common building bricks, when made by hand, and a day's work for the press-gang is to temper the clay, mould, press and finish one thousand one hundred and sixty-seven bricks.

Whatever method is employed for tempering the clay, whether it be by hand or by the pug-mill or by the clay-tempering wheel, it is necessary that the work should be thoroughly done. The clay should be very carefully selected, and should be weathered by exposing it during the winter. The clay, in addition to being not too strong, should be free from stones, gravel and other defective substances. Pressed-bricks are usually slightly larger than common bricks, being generally made of weak clay, in order to give them a rich color; but the same causes which operate to change the size of common bricks apply also to this finer grade of bricks. The moulder has his table placed in the moulding-shed at a convenient point near where the bricks are to be laid for drying, but before the work of moulding commences, the floor is luted over smoothly, and all "crumbs" or other particles which would cause defects in the gluts are removed, after which a very light sifting of moulding-sand is thrown over the floor.

The tempered clay having been piled upon the table in front of the moulder, he pulls a portion of it down with both hands, and after throwing a small quantity of moulding-sand over the lump of clay pulled down, both clay and sand are next worked into a peculiar form, called "the warp," and this he dashes with great momentum into the glut-mould which rests upon the moulding-cleat, both hands being used in the operation. The clay having been dashed into the mould, the moulder next pats and works it with the palm of his hand so as to make the corners and other portions of the mould solid. After patting and working the clay in this manner for a short time, the moulder next takes an instrument like a plasterer's trowel, called a "moulder's plane," with which he strikes off the superfluous clay piled above the top of the mould. It requires greater skill to mould the rough gluts than it does to mould the best quality of common building bricks, and it is highly essential that the gluts should be moulded free of flaws or sand-cracks, which would spoil the appearance and value of the pressed-bricks. The glut-moulds in common use in Philadelphia, Baltimore and Washington are known as the "single cast-iron moulds," and are light cast-iron boxes having both the top and bottom open and unobstructed, and the moulds are twice as long as they are wide. It is a great point in using these glut-moulds to keep the interior faces and corners perfectly clean, and this work is done by the off-bearer, who scrapes the inside of the boxes with an old case-knife which he carries suspended by a string from his side. The gluts having been moulded, the off-bearer carries the brick and lays it out upon the floor of the shed, the same as is done in moulding common bricks, and having deposited the bricks, he places the glut-moulds in a tub containing sand, at a point convenient to the moulder, and these operations are repeated until the number of bricks have been made which forms the day's task. The moulding-sand is an important item in manufacturing pressed-bricks, as the color and smoothness of the "skin" of the brick depend largely upon the quality of the sand employed. A No. 60 sieve is the kind commonly employed for sifting the dried sand for moulding pressed-bricks. The gluts, after being allowed to become quite dry, receive a light sifting of sand over their flat faces, after which they are turned over, in order that they may dry more regularly, and another light sifting of moulding-sand is spread over the upturned faces.

Sheds built expressly for the purpose of drying pressed-bricks are constructed with roofs which are capable of being opened so as to admit sun and air when required; but sometimes the roofs of the drying-shed are built in the same manner as for the drying-sheds used for common bricks, but the sides are fitted with slats which can be turned on pivots so as to assume a horizontal or other position, as may be desired for the admission of sun and air. It is important that the bricks should not dry too rapidly, as in such cases cracks are apt to form in the faces of the bricks which would spoil their market value, and in case too rapid drying has commenced, a piece of old carpet dampened with water can be laid over the bricks and occasionally sprinkled with water. The pressed-bricks are seldom hacked on edge in the drying-sheds, as in the case of common bricks, but are laid flat-wise, each pile being a separate one, and a space of about three inches is left around each hack; they hold a better shape in this manner of drying than if hacked on edge, but after the glut has been pressed in the hand-press they are differently hacked, as will be explained.

When the gluts are in a proper state for pressing, say when they can be handled without finger-marks, the press is taken to the bricks. Placing the press on the gang-planks or boards, the bricks are carefully put into the mould, great care being exercised that they are not marked in dropping them in. There should be no finger-marks on the gluts, and all "crumbs" must be wiped off of the moulds, and also off the lid. After the bricks are pressed they are generally laid flat, five or six high, and when partly dry they are lightly rubbed with the hand and piled pigeon-hole shape, which allows further drying; in some cases they are piled in squares, edgewise, five or six high. When dry, the pressed-bricks are placed on wheel-barrows, with strips of soft wood or woolen blankets between each course, and carried to the drying-sheds, where they remain until required for burning.

In manufacturing the first quality of pressed-bricks it is highly important that the press in which the gluts are finished should receive proper attention, and while the press is in use the mould-lid and plate should always be kept clean. The plunger-plate should occasionally be raised, and any dirt that may have accumulated on it should be wiped off, and a slight oiling occasionally given to all the parts while the press is in use. The proprietor of the works should make it a fixed rule that when the day's work of pressing is ended, the presser shall remove the plunger from the press, clean the mould-lid and plate, oil the surfaces, and afterward properly replace the plunger. Care should be particularly exercised that all the wearing parts of the press are occasionally oiled while the press is being used. The gluts, as well as the finished green pressed-bricks should receive constant attention during the drying process, as has been previously stated, and every precaution should be observed to protect the stock from unequal dryings. After the bricks have been thoroughly dried, they are ready to be set or placed in the kilns for burning. Pressed-bricks are, in the cities of Baltimore and Washington, usually set eight courses high in the kilns, but the writer has seen them carried twelve or fourteen courses in height in the city of Philadelphia. The top course of pressed-bricks does not usually extend closer than the second or third course from the top of the kiln; the final two or three courses, being composed of common bricks, as the top courses do not usually burn very hard, and have to be sent out for soft or "salmon" bricks. Pressed-bricks are set somewhat differently in the kiln from the manner in which common bricks are placed, the desire being to preserve the faces which are to be finally exposed in the walls of a building.

There is not the same amount of crossing or "checkering" of "pressed-bricks" as is the custom in setting common stock. The bottom, one middle, and the top courses are crossed or checkered in setting eight courses high, the pressed-bricks being set one directly over the other on edge; the "cross-ties" are to hold the bricks in a body and thus prevent them from "wobbling" or slanting from either side. Great care and experience in setting, as well as in burning kilns containing great quantities of pressed-bricks, are highly essential. If the bricks are not properly set they are liable to fall during the early stages of firing, for it may not be generally known that all things made of moulded clay, although they may appear to be perfectly dry when they first go into the kiln, again become soft and almost as plastic as they were when first moulded, and it is this stage of burning that causes so many defects in pressed-bricks. The early stage of burning is the most trying time for all clays, and it is the period in which the clay is yielding the water chemically combined with it, and, in the language of the brick-yard, the bricks are "going

through the sweat." It is impossible to so dry the bricks that they will not be subjected to this sweating operation after being placed in the kiln and fire started under them. Should even the adobes or sun-dried bricks of Egypt, which have been exposed to the influences of that moisture-extracting climate for more than three thousand years, be placed in a kiln and burned, the result would be the same; the adobes would "go through the sweat," and become soft and plastic before they were burned into hard bricks.

While the pressed-bricks are in the drying-sheds, a large proportion of the water mechanically combined with the clay is extracted from the bricks, but the water chemically combined can be driven out only by the process of burning. The necessity of thoroughly drying the pressed-bricks while in the sheds, and afterward carefully placing them in the kiln, will be manifest from the foregoing explanation. When the kiln contains pressed-bricks, too hard firing in settling the kiln must be avoided, otherwise the settling fires would be liable to cause all the pressed-bricks to "tumble" or fall, and the fires at this stage are consequently lighter but more frequent than when the kiln contains only common bricks.

The greatest precaution is always observed in handling the pressed-bricks before and after burning, much more attention being paid to these bricks than to common bricks. In carrying the bricks to the kiln they are taken up one at a time, placed lightly on the wheelbarrows, and between each course of bricks on edge there is placed a strip of soft wood or a good thickness of some kind of woollen stuff, such as an old blanket. When the bricks arrive at the kiln they are lightly removed from the wheel-barrows, one at a time, and are very carefully handled and tossed, also one at a time, to the setter; but no extra money is paid to the setting gang for handling pressed-bricks; the work is included in the task. After the bricks have been burned, great pains are taken, after removing them from the kiln, to preserve the sharp corners and edges, which are called the "arrises," and the bricks, after being tossed carefully, are placed on wheel-barrows and carried to sheds where the defective ones are culled out and the perfect ones assorted, for uniformity of color, the light-colored pressed-bricks being hacked together, and the medium and dark-colored bricks being also kept separate.

Ornamental bricks are usually made in the same manner as fine pressed-bricks. The quantities produced for a day's work are less, but vary with the size and complication of the designs. The hand-presses, in which ornamental bricks are pressed, after being moulded in the form of gluts, sometimes have larger mould-boxes than for ordinary pressed-bricks, and when small designs are to be finished, and which do not fill up the mould, suitable blocks of hard wood are used for "fillers" between the patterns. Ornamental bricks, of superior quality are now produced in large quantities in Philadelphia, Baltimore, Washington, St. Louis and Chicago, and these artistic executions in clay have done much to add to the beauty and variety of architectural constructions, by breaking up plain brick surfaces and substituting reliefs and intaglio ornamentation. When a person builds a dwelling for his own occupation, he usually makes an exact picture of his tastes, and exhibits a degree of his refinement and cultivation, whether the structure be costly or not, the same as he does in his dress and personal appearance, for plain people build, dress and live plainly, and as we have had a majority of this kind in the times gone by we now possess their pictures in the plain, unassuming buildings which survive them. But that period is now rapidly passing away, and attractive designs in architectural construction are to be seen in all locations, in suburbs and country as well as in towns and cities, and now our American builders are in many instances combining elegance of appearance with solidity of construction. It is not at all necessary to make a house expensive in order to make it attractive, for some of the most costly structures are the least so. Pleasing ornamentations in burned clay can now be produced so cheaply that a person who builds a brick house without employing them generally does so from lack of all desire for these embellishments of the exterior of his home.

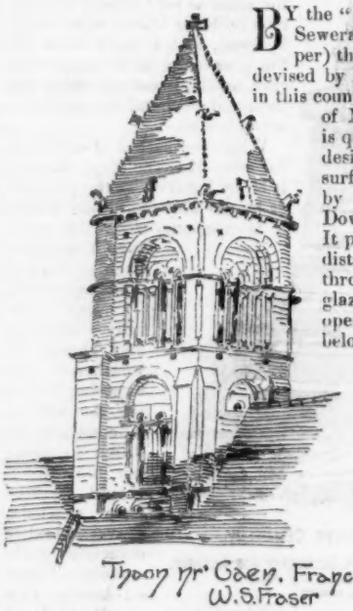
Some forms of ornamental bricks are pressed directly from damp clay after having been granulated; but the best qualities of ornamental bricks are made from tempered clay, and are moulded in the form of gluts and afterward pressed by hand in a suitable brick-press, as has been described. In the manufacture of ornamental bricks great care has to be observed that the clay is free from stones and small gravel, and also in the handling, rubbing or sanding and drying of the green bricks, great watchfulness is necessary, for if the drying be done too rapidly the ornamental bricks will have small cracks over their surfaces, which are great objections in the eyes of buyers. When the bricks are placed in the kiln, it is necessary that they should be carried along very gently for a time after the fire is started under them, as during the burning or firing the bricks are liable to "crush" or "squeeze," while the steam or "water-smoke" is being driven off.

Ornamental bricks, in addition to being produced in the ordinary red color, are also manufactured in caustic colors, as buff, brown, chocolate-brown, black, etc., and they are also enamelled in any desired hue, such as red, yellow, blue, green, etc. For ornamental bricks having encaustic colors, the coloring oxides are mixed with the clay in quantities usually of seven to ten per cent. The coloring oxides act as fluxes, and the composition of the body must be altered in some cases to counteract this. Ornamental bricks, like ordinary pressed-bricks, are sometimes colored under the glaze, and at other times the colors are in the glaze. When the color is to be applied under the glaze, the burned bricks are dipped into a slip of colored clay, formed usually of one part colored glass, ground, and two parts of clay, the latter causing adhesion of the slip, and the brick is either then fired, or, after being allowed to dry, it is coated with a transparent glaze and then fired; but the brick should be heated before applying the glaze, in order that all oily substances may be removed. When it is desired to apply the colors in the glaze, the brick is dipped into a transparent, colored glaze, usually formed, besides the coloring oxide, of oxide of lead, silicious sand and salt.

All enamels and glazes for ornamental bricks are usually applied to the one face or head which will be exposed after laying in the walls, except those intended to be used for corners and reveals of windows and door-jambs, which have one face and head treated, and are termed "rights and lefts" when they are so moulded or ornamented that they cannot be used for any corner. The colors now mostly used for architectural decorations and chromatic brickwork are the same, with the exception of buff and brown, as those employed by the ancient Egyptians, namely: red, yellow, blue, sometimes green, and white and black. In addition to the colors which have been given for ornamental bricks, there are others which are sometimes employed, especially for interior and expensive decorative purposes; they are turquoise, bronze-green, olive-green, violet, purple, orange, carmine, pink, gray and indigo.

Charles T. Davis.

SUB-SURFACE IRRIGATION SYSTEM OF SEWAGE DISPOSAL.[1]



By the "Small Pipe System of Inland Sewerage," is meant (in this paper) that system of sewage-disposal devised by Mr. Moule, and popularized in this country by Col. Geo. E. Waring, of Newport, by whose name it is quite generally known. It is designated by some the "Sub-surface Irrigation System," and by others, the "Interrupted Downward Filteration System." It provides for the intermittent distribution of liquid sewage through a system of small unglazed earthen pipes, laid with open joints, from 8 to 16 inches below the surface of the ground, having such relation to each other and to the soil in which they are laid, both as regards its density and slope, that the liquid flowing through them will find its way readily into the ground, but, be sufficiently retained to reach the whole system of distributing pipes.

It is necessary for the success of this system that the ground employed should be drained, either naturally or artificially, so that absorption will take place promptly, and that there should be a flush-tank discharging its contents through an automatically acting siphon. There should be such relation between the size of this flush-tank and the soakage-area, that the whole system of pipes will be filled at one discharge of the tank, and such relation between the whole amount of sewage to be disposed of and the soakage-area employed, that the liquid from one discharge of the tank will have become absorbed by the soil into which it is distributed, before a second discharge. To adjust all these requirements perfectly, demands a nice judgment and a skilful hand. The nature of the soil must be taken into consideration. A clayey soil may be too retentive, and a soil composed mostly of sand may be too loose for the perfect working of this system; but, as the area required is small, it would cost but little to add sufficient sand to the former, and sufficient clay to the latter to render it suitable. When organic matter is absorbed into the soil near the surface, as provided for by this system of sub-surface irrigation, coming in contact as it does, in a state of minute subdivision, with the air and condensed oxygen[2] contained in the porous soil, it undergoes a rapid oxidation.

The change which takes place is in every essential particular equivalent to that of combustion. The organic matter thus treated

[1] A Paper read before the New Jersey Sanitary Association at their tenth Annual Meeting, in the Assembly Chamber at the State House, Trenton N. J., December 4th, 1884, by Dr. J. W. Pinkham, of Montclair.

[2] Schubler says: (*Journal Royal Agricultural Society*, vol. 1, p. 197.) The earths possess the remarkable property of absorbing oxygen gas from the atmospheric air, a phenomenon pointed out many years ago by A. Von Humboldt. . . . This property of the earths is confirmed almost without exception, provided they be employed for this purpose in a moist state. In the experiment which he instituted exposing one thousand grains of different earths for thirty days in vessels of 15 inches cubic contents (15 inches of air containing 3.12 inches of oxygen) he found that sandy loam absorbed 1.39 inches of oxygen, clay loam absorbed 1.65 inches and garden mould 2.60 inches.

NAME.	Size of family.	Approximate first cost of system.	Approximate cost of annual maintenance.	Length of time in use.	Is system free from nuisance?	Is all house waste satisfactorily disposed of?	Have stoppages occurred?	Is the soakage area under-drained?	Is it superficially dry?	Give any facts which you think may be of service in determining to what extent and under what circumstances can this system be recommended for general use.
C. M. Marvin, Montclair, N. J.	5	$200	$10	19 mos.	yes	no	no	no	yes	I believe it possible for the entire village of Montclair to be relieved, by disposing of its sewage matter by this system. The Women's Prison at Sherborn, Mass., uses this method, and there is a large amount of water consumed there. You are probably aware of the particulars in this case. The tanks discharge 15,000 gallons at a time, and they discharge alternately into two sets of drains of 10,000 feet each. At my own house I have had a switch put in the main sewer pipe so that I can use 200 feet alternately. By doing this I can distribute the liquid waste more evenly, and have a more uniform growth of grass on the surface of the ground. For in all cases the upper lines of pipe (those nearest the tanks) are apt to receive the larger quantity of waste, although they do not receive more than they can take care of. Yours truly, C. M. MARVIN.
P. S. Attick, Bryn Mawr, Pa.	hotel	2,000	——	5 yrs.	yes	yes	yes	no	yes	
Chas. Scheffiin, Plainfield, N. J.	8	——	——	5 yrs.	yes	yes	no	no	yes	I consider the system in every respect adapted to suburban, or any residence having a sufficient area of garden or lawn.
B. I. Tuthill, Montclair, N. J.	7	200	——	6 mos.	yes	yes	no	no	yes	So long as we have used it, it has been very satisfactory, and it seems to be the best system we have tried.
No Name.	10	200	12	2¾ yrs.	yes	yes	no	no	yes	
S. C. Burdick, Brick Church, Orange, N. J.	14	1,000	10	3 yrs.	yes	yes	no	no	yes	
E. Eaton, 19 Mercer St., N. Y.	6	350	12	6 yrs.	yes	yes	no	no	yes	I consider this system as satisfactory as any, if not more so.
C. Morgan, 83 Dey St., N. Y.	8	500	25	2½ yrs.	yes	yes	no	no	yes	You have the facts above, to which I have nothing to add save the opinion that it is a perfect success.
J. P. Davis, 21 Maiden Lane, N. Y.	10	170	——	2½ yrs.	yes	yes	no	no	yes	
J. E. Pulsford, 45 William St., N.Y.	15	400	20	3 yrs.	yes	yes	yes	no	yes	It can be recommended.
J. W. Towne, 140 Nassau St., N.Y.	14	300	10	10 yrs.	yes	yes	no	no	yes	
J. E. Knapp, 24 Pine St., N. Y.	9	250	15	3 yrs.	yes	yes	yes	no	yes	
W. F. Havemeyer, 112 Wall St., N. Y.	6	200	12	3 yrs.	yes	yes	no	no	yes	System is the best devised where there is sufficient room for pipes in dry lawn free from shade. I empty settling-tank about twice a year, though it is not absolutely necessary.
Dav. Bingham, New Produce Exchange, N. Y.	12	250	——	5 yrs.	yes	yes	no	no	yes	The system I consider perfect, wherever the party adopting it controls sufficient area for adequate distribution of the "small" or distributing pipes.
Ham. Wallis, 48 Wall St., N. Y.	9	350	10	2 yrs.	yes	yes	no	no	yes	
Gard. P. Lloyd, 110 Broadway, N. Y.	8	250	12	4½ yrs.	yes	yes	no	no	yes	I think with good care in making this system — iron pipes, etc., from house to cesspool — that it will work well in all cases where the land gives sufficient fall to pipes.
J. C. Howes, 52 Wall St., N. Y.	8	250	25	1 year.	yes	no	no	no	yes	I recommend it freely for general use where conditions and space of ground are favorable. The settling-tank needs cleaning out by removing the solid matter twice a year or oftener, and the ventilation-pipes need to be carried high above ridge of dwelling to prevent any odor being blown down by the winds.
R. C. Browning, 32 Cortlandt St., N. Y.	8	500	15	4 yrs.	yes	yes	no	no	yes	
B. Shepard, 26 Worth St., N. Y.	7	——	——	5 yrs.	yes	yes	no	no	yes	
P. M. Pompelly.	10	250	10	2 yrs.	yes	yes	no	no	yes	
Rowland Johnson, 5 Mercer St., N. Y.	8	380	10	19 mos.	yes	yes	no	no	yes	
Saml. Crump, Montclair, N. J.	10	175	10	3 mos.	yes	yes	no	no	yes	
E. A. Bradley, Montclair, N. J.	9	225	——	4 yrs.	yes	yes	no	no	yes	During the last three years there has not been the least trouble with the system.
Francis Speer, 135 Duane St., N. Y.	8	250	20	5 yrs.	yes	yes	no	no	yes	I have my tanks, or brick cesspools, opened every three months, and the solid matter removed and mixed with the manure heap.
Paul Babcock, Montclair, N. J.	8	——	30	2 yrs.	yes	yes	no	no	yes	Only fact I can mention is the very satisfactory working of the system at my home.
Chas. Cooper, Goshen, N. Y.	7	250	——	2½ yrs.	yes	yes	no	no	yes	As far as I can judge, where there is a fall sufficient for water to run freely it is without fault.
John T. Rockwell, 101 Duane St., N. Y.	7	400	15	2½ yrs.	yes	yes	no	no	yes	Have two 3-inch ventilating-pipes extending above the house-roof, one inside, and the other outside of the house, together ventilating the entire system. The above is my only experience with this method of disposing of house waste. Thus far it is satisfactory.
W. W. Underhill, Montclair, N. J.	12	185	none	18 mos.	yes	yes	no	no	yes	My experience and knowledge lead me to believe that this system might probably be safely recommended for general use in a town as thickly settled as Montclair; no facts leading to an opposite conclusion have as yet come under my observation.
Henry M. Oddie, 23 Nassau St, N. Y.	9	300	12	3½ yrs.	yes	yes	once	yes	yes	I can only speak from personal experience, that the system has been very satisfactory.
J. D. Palmer, Brick Church, Orange, N. J.	8	200	——	3 yrs.	yes	yes	yes	no	yes	I regard the system as fairly successful, and the next best to the small-pipe sewer system.
Chas. A. Sterling, 55 Broadway, N. Y.	10	400	12	1 year.	yes	yes	no	no	yes	I consider the system excellent if properly constructed, and sufficient area on the premises available for the distribution of the sewage. If the work is thoroughly and scientifically done I would recommend it for general use, but otherwise it (the system) would be worse than useless. I have the system in use on my property, corner E. Park St. and Washington, for about four years without any cost for repairs, and now working very satisfactorily.
R. C. Ryerson, Caldwell, N. J.	9	200	10	3 yrs.	yes	yes	no	no	yes	
Essex County Penitentiary, Caldwell, N. J.	150	500	50	4 yrs.	yes	yes	no	no	yes	The distributing-pipes were first laid so that fluid from the tanks reached only a portion of the soakage-area and there was consequently supersaturation. At present there is no difficulty with the system, and it gives entire satisfaction. Five thousand gallons of water are used daily. Since the introduction of this system there have been no cases of typhoid in the institution; previously there had been cases.
Geo. E. Simpson, Orange, N. J.	12	240	15	3½ yrs.	yes	yes	no	no	yes	
W. H. Jewett, Montclair, N. J.	4	225	1[illegible]	1 year.	yes	yes	no	no	yes	I have studied the system and believe there is nothing in the world like it for suburban and country places. Brick Church, N. J., Nov. 28, 1884.
Mrs. G. W. Thorp,	5	550	12	18 mos.	yes	yes	no	no	yes	Dr. J. W. Pinkham.
J. G. Thorp, Brick Church, Orange, N. J.	4	450	12	16 mos.	yes	yes	no	no	yes	*Dear Sir,* — I take pleasure in returning the enclosed blanks filled out as per request of Mr. Geo. P. Olcott, who inserted the system under discussion (with modifications of his own, and with which I suppose you are acquainted) in two of my lots in East Orange. A third place in Main St. is in working order, but has not had the test of time as yet. I shall be glad to furnish you with any particulars in regard to these three systems at any time. Yours very truly, Mrs. GEO. W. THORP, per J. G. Thorp.
Robert Lane, East Orange, N. J.	6	250	12	2 yrs.	yes	yes	no	no	yes	

In order that the negative and affirmative answers in the above table may convey no wrong impression, I desire to say that in the few cases where qualified answers were given, they are represented in the table by a "yes," which in the answer was "yes, to a small extent," and by a "no," which was "no, not to any extent" or words of similar import. Without this explanation the tabular statement would be less favorable to the system than were the answers received, which in no case represented that there had been serious difficulty, or that there was dissatisfaction with the system. J. W. P.

is just as much destroyed as if it were burnt, and the resulting products are as harmless as the products of combustion of wood or coal. Soil which has been used in this way for many years has been found to be but little changed, the liquid resultants of disintegration having evaporated or become absorbed by the roots of plants, while the solid resultants which remain, but slightly (and not in any essential particular), differ from the original constituents of the soil. Theoretically this system is perfect, but, the question, "will it work in actual practice," is legitimate, and is constantly asked. The best answer to the question "will it work," is the answer to the question "has it worked." The principal object of this paper is to present to this Association the testimony of those who have had practical knowledge of this system, — of the engineers who have constructed the works, and of the owners of places on which the system has been tried. The word "tried" has been used intentionally, for no system can be recommended for adoption, however perfect it may be in theory, until it has been subjected to the crucial test of prolonged trial, and it is important to know, not what a system will do under skilful management, but what it will do under the somewhat negligent management which it is likely to receive. A system which requires for its operation the constant supervision of an expert, will fail on account of the impossibility of obtaining such expert supervision. In studying this system at the present time, we are fortunate in being able to form our conclusions concerning its merits, not from the reasonableness of its theory, nor the weight of opinion which supports, but from the testimony of those who have tried it.

In collecting this testimony, I have been aided by Mr. James C. Bayles, and Mr. Geo. P. Olcott, Civil Engineers of Orange, who have kindly furnished me with the names and addresses of their patrons. To secure the desired information I addressed the following circular to about sixty people, who for various lengths of time have employed the subsurface irrigation system: —

Dear Sir, — Wishing to collect facts concerning the practical working of the "*Small-pipe System of Inland Sewerage*," and learning that you have had opportunities for observing its operation and forming an opinion of its merits, I take the liberty of sending to you the enclosed blank, which I will ask you to kindly fill out and forward to me by return mail.

Yours, respectfully, J. W. Pinkham.

State. — 1. Size of family. 2. Approximate first cost of system. 3. Approximate cost of annual maintenance. 4. Length of time in use. 5. Is system free from nuisance? 6. Is all house waste satisfactory disposed of? 7. Have stoppages occurred? 8. Is the soakage area underdrained? 9. Is it superficially dry? 10. Give any facts which you think may be of service in determining to what extent and under what circumstances this system can be recommended for general use.

The answers to these questions I will present to you as they have been received, omitting only the portions which are irrevelant. These answers [see preceding Table] constitute the testimony which I have collected concerning the practical working of the sub-surface irrigation system for the disposal of house sewage.

Dr. Whitehorne, physician of the Essex County Penitentiary, in addition to his answer to question 10, further says:

"I would say that the fact of the utility of the system is patent, and under proper conditions is available for the healthful disposal of the sewage equally of the smallest family or the largest public institution. Before the change was made here the solid fæcal matters were composted and made use of on the farm, but a large portion of the immense amount of liquid, holding noxious matter in suspension, found its way into a neighboring brook, and contaminated both the air and the running water, being perceptible as far as Caldwell village, three-fourths of a mile distant. At present the solids are equally available for composting, and the saturated liquids, by means of the system of laterals, are disposed of without defiling the running water below. During summer the ground above is made use of for a kitchen garden, and produces abundantly, so that thus controlled, these elements otherwise poisonous, are made subservient to the good of man. Trusting that the foregoing may be acceptable to you, I am,

Very truly yours, H. B. Whitehorne."

I will add to this the opinions of several civil engineers who have had ample opportunities for observation.

Mr. Geo. E. Waring says: "The sub-surface irrigation system is much the simplest, the safest and the best, its cost is trifling, even where the water from the kitchen and laundry trays in the cellar has to be lifted with a pump to the level of the drains."

My own system has worked perfectly, summer and winter, for seven years. I have never heard of a case of failure.

Mr. Edward S. Philbrick says: "There are so many places where this system is applicable and its merits are so great in such places that a full and detailed description of it may be of interest. The limits of its application are as follows: Wherever a quarter of an acre of grass land is available for a single family of eight or ten persons, or an acre for an aggregate of eighty persons, so situated that the surface of the sod is five feet or more below the level of the house drain, where it leaves the house or houses, this system will dispose of all their sewage in a satisfactory manner, summer and winter, with very little attention, for a term of years."

I now submit the question to you without argument. I will venture, however, to make the following summary of conclusions, which I think are fairly deducible from the foregoing testimony.

In Orange, Montclair, Caldwell and Dun Ellen, New Jersey, in Goshen, New York, and in Bryn Mawr, Pa., the system of sewerage known as the Sub-surface Irrigation System constructed under the superintendence of Mr. Geo. P. Olcott and Mr. James C. Bayles, of Orange, and Mr. James Owen, of Montclair, has, after (in many cases) prolonged trial, proved a success.

2. The first cost for a family and house of average size, is about two hundred dollars.

3. The cost of annual maintenance is about ten dollars for such a house.

4. The ground selected should be free from shade, and may be either lawn or garden.

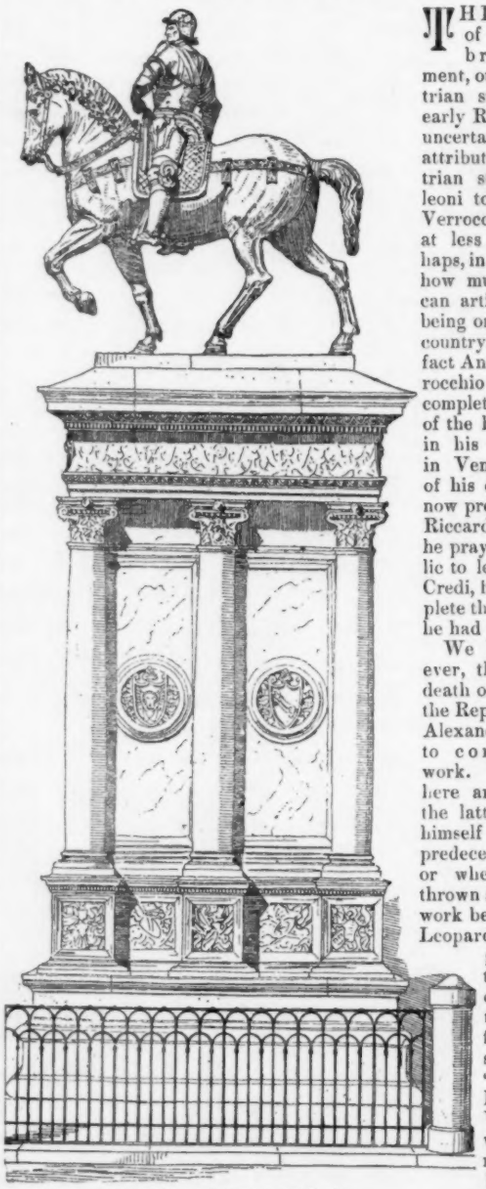
5. By means of this system all liquid sewage from the smallest dwelling house or the largest institution, may be effectually disposed of without nuisance and without peril to health.

6. This system should take the place of cesspools in all suburban and country places which have sufficient ground for the distribution of pipes.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

THE COLLEONI MONUMENT, VENICE, ITALY.

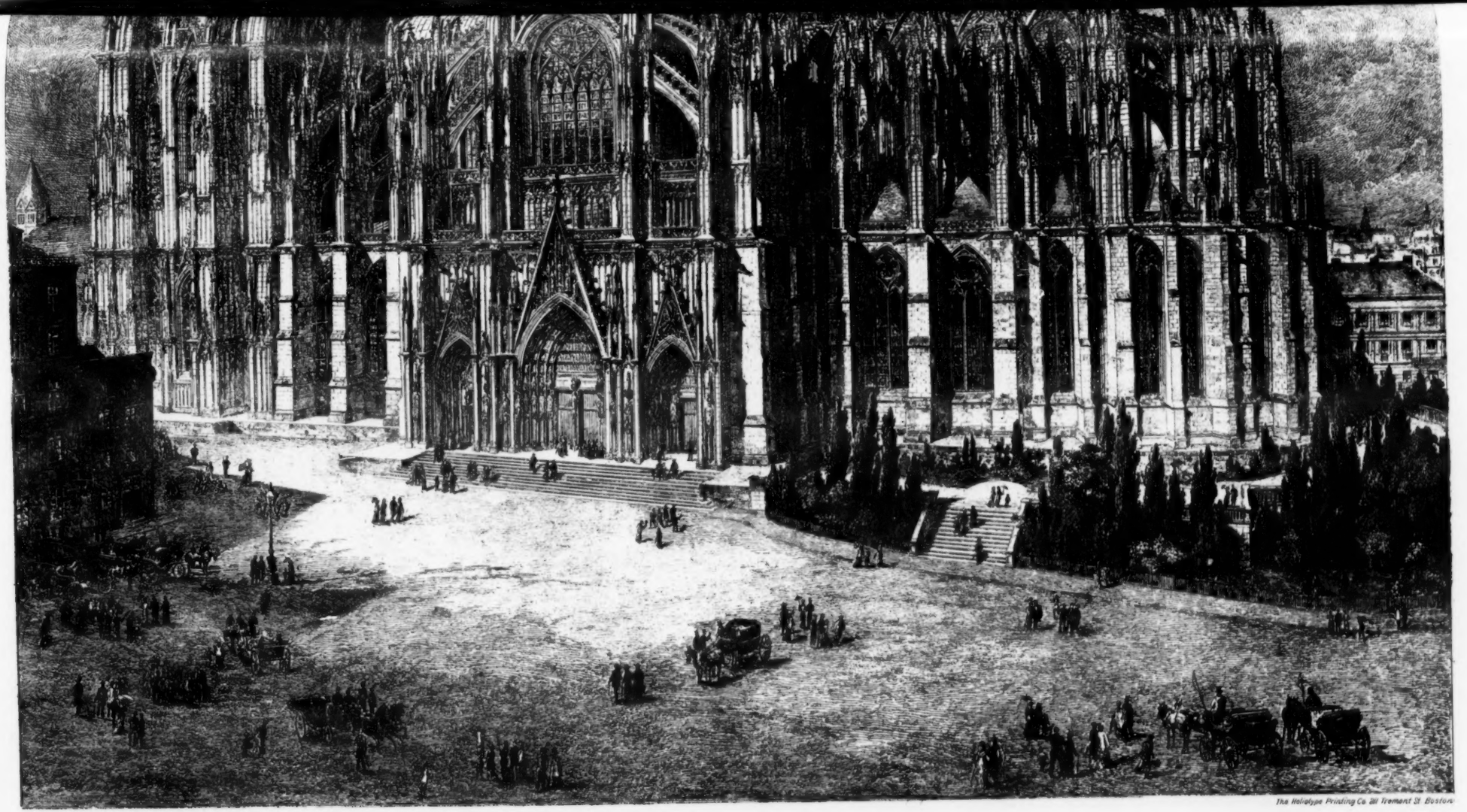


The Colleoni Monument, Venice.

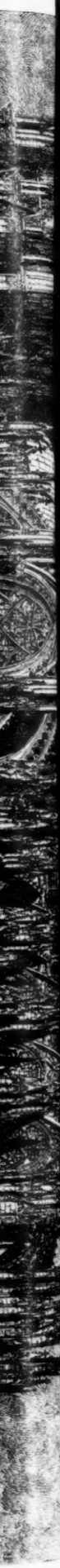
THE authorship of this so celebrated monument, our best equestrian statue of the early Renaissance, is uncertain. Vasari attributes the equestrian statue of Colleoni to Andrea del Verrocchio; he was at less pains, perhaps, in investigating how much the Tuscan artist had done, being one of his own countrymen, but in fact Andrea del Verrocchio had not even completed the model of the horse, because in his will, written in Venice the year of his death (1488), now preserved in the Riccardian Library, he prays the Republic to let Lorenzo di Credi, his pupil, complete the work which he had begun.[1]

We know, however, that after the death of Verrocchio, the Republic ordered Alexander Leopardi to continue the work. The doubt here arises whether the latter availed himself of what his predecessor had left, or whether it was thrown away and the work begun anew by Leopardi. On the girth under the stomach of the horse there is the following inscription: "Alexander Leopardvs V. F. Opvs," which may be read either *Venetus Fecit* (made) or *Venetus Fudit* (cast). We have the testimonial of Vasari that Verrocchio did the work, and Sansovino himself, in his "*Venetia Descritta*," corroborates Vasari. Both the biographer and the historian are Tuscans, therefore liable to be suspected of partiality for an artist of their own province, but, as we saw before, the will of Verrocchio proves that the most artistic part of the monument had been already begun by himself, and he had carried it so far forward,

[1] "*Etiam relinquo opus equi per me principiati et ipsum perficiendum, si placuerit iltmo. Dmi. Do. Venetiarum, ducale dominium humiliter supplico, ut dignetur permittere dictum Laurentium perficere dictum opus quia est sufficiens ad id perficiendum.*" (*Gaye, carteggio inedito d' Artisti, I. 309.*)



Cologne Cathedral.



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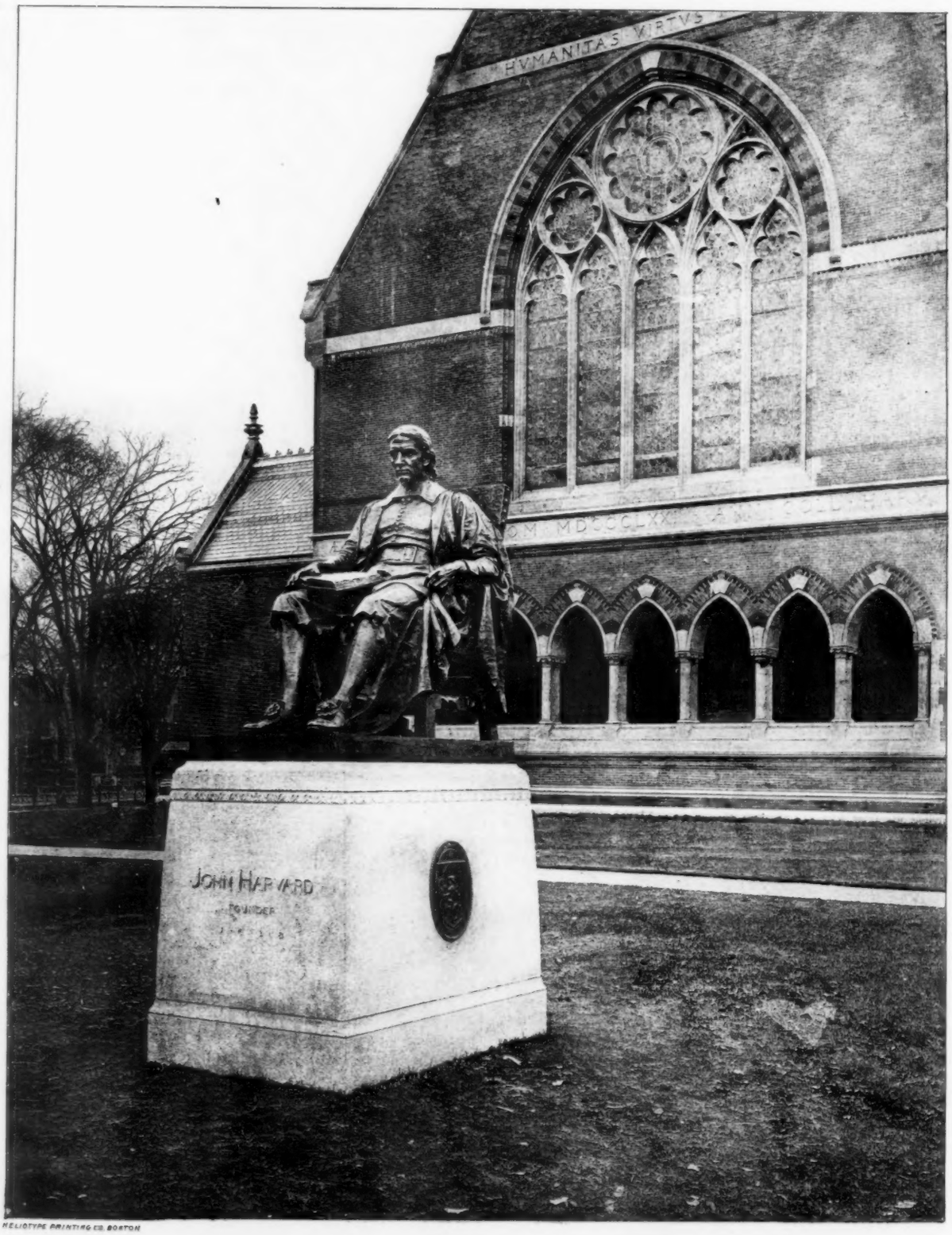

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Statue of John Harvard, Cambridge, Mass.
Daniel C. French, Sculptor.

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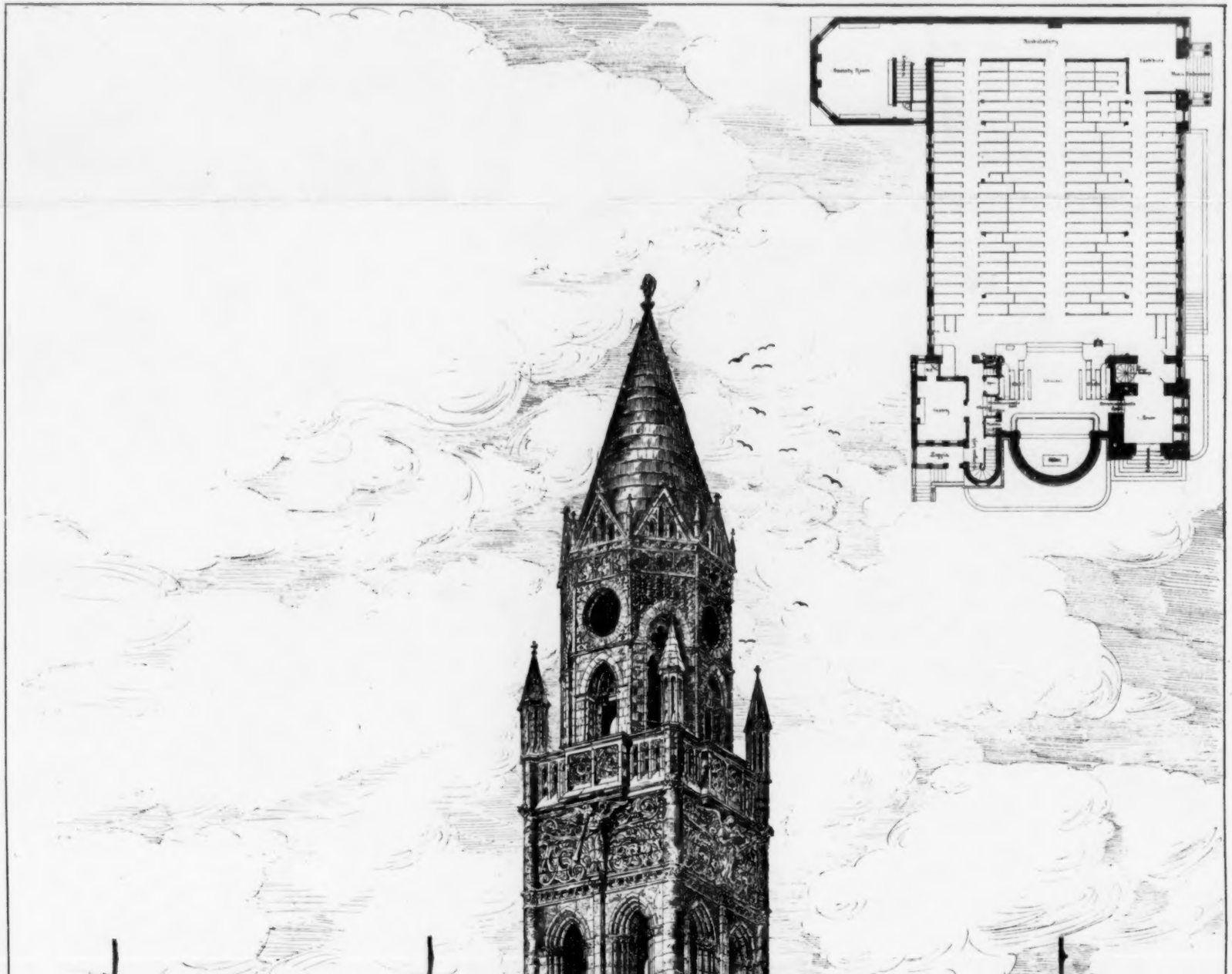

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The Colleoni Monument, Venice.

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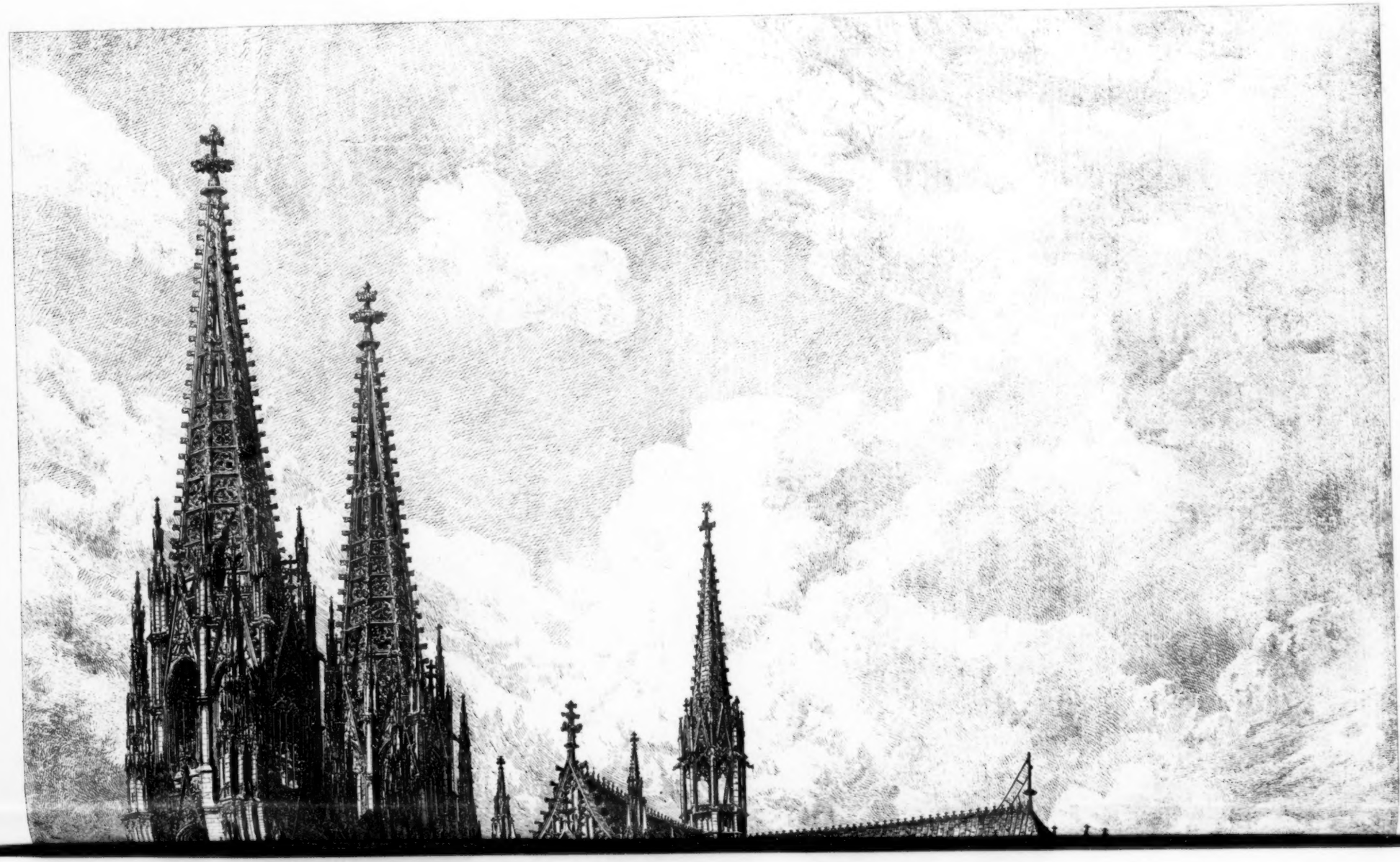


that at his death his only anxiety was that it should be finished by some one he trusted.

We do not know why the Republic did not conform to the wish of so great an artist, after his death; but perhaps, though it had been induced to invite the Tuscan sculptor to do the work on account of his renown, it was not equally disposed to let any other stranger finish it, and the fame of the Venetian, Leopardi, then already spreading, determined the Republic to dismiss the disciple of Verrocchio, Lorenzo di Credi, and to give an opportunity to a citizen of the Republic to have the glory of completing the work.

We may gather this from the avowal which on the tomb of his family at the *Madonna dell' Orto*, he recorded himself, while still living, as having made the pedestal of the horse of Colleoni. And also from the tone of the most creditable writers of the period. Here is what Marin Sanudo says in his *diarii* (date 1493; I, 96):

"This day, Monday, March 21, in Venice, the bronze horse of Bartolomeus Colleoni, our late captain-general, placed in the campo SS. Gio. Paolo, was uncovered. It is a very fine work, which the masters have just finished gilding. Everybody went to see it. The artist who did it, besides much money from the Council of X when the work was completed, had a yearly pension of 100 ducats granted to him for life. On the pedestal which supports the horse are these words: 'Bartolomeo Coleono Bergomensi ob Militare Imperivm optime gestvm;' and on the other side, 'Ioanne Mavro et Marino Venerio Cvratoribvs Anno Salvtis MCCCCLXXXXV;' and under the girth of the horse, 'Alexander Leopardvs F.'" Giacomo Boni.

STATUE OF JOHN HARVARD, CAMBRIDGE, MASS. MR. DANIEL C. FRENCH, SCULPTOR, CONCORD, MASS.

This ideal statue of the founder of Harvard College, the gift of Mr. Samuel J. Bridges to the University, was unveiled October 15, 1884. Of the subject of this statue, which was cast by the Henry-Bonard Company of New York, the Rev. George Ellis says:

"We know neither his birth-time, nor birth-place, nor lineage, nor parentage. His name appears on the entry book at Emmanuel College, Cambridge, in 1628. He was matriculated there as pensioner, — that is, one who can pay his own charges, — July 7, 1631. The signature for his bachelor's degree is dated 1631, and that for his master's degree, 1635. There all we know of John Harvard in England stops. He is called 'Reverend' here, and was known as a preacher. But we are in ignorance whether he had been episcopally ordained in England, and thereis no record of his ordination as a dissenting teacher there or here. The artist would know the number of his years. We cannot tell them. All that we have to guide us is that, supposing him to have been of the average age of twenty on taking his bachelor's degree, he would have been twenty-seven at his death here. Milton, who was born in 1608, was matriculated at the same University, though at another college, — Christ's, — which he entered in 1624, at the age of sixteen. But he did not reach a degree. . . . We do not know at what port of exit, in what vessel, at what date, or with what companionship, Harvard embarked for this country, nor the time of his arrival. His presence here is first recognized by his admission as an inhabitant of Charlestown, August 1, 1637, and as 'sometimes minister of God's word' in that town, assisting Mr. Symmes, the pastor of Charlestown Church, of which Harvard and his wife were admitted members. He received grants of land from the town, and on April 26, 1638, was on a committee 'to consider of some things tending towards a body of laws.' The site of the house which he built is known. Judge Sewall speaks of lodging in a chamber of it, January 26, 1697. It was probably burned in the battle, June 17, 1775. Harvard died of consumption, in Charlestown, September 12 (o. s., Sept. 22 n. s.), 1638, only a little more than a year after the first mention of his presence in New England. By a nuncupative will, of which there is no record or administration, he is said to have left all his library, 'and half of his estate, being £800,' to the college, which the court had two years previous voted to establish at the 'New Town,' afterwards called Cambridge. Such is the ambiguity of language, that it seems impossible to decide whether the whole or half of his estate was £800. Nor do the accounts and receipts of the bursars of the college satisfactorily settle the doubt. If Harvard was possessed of £1600, it was a very large estate for those days. Probably it was invested in England, causing delayed and fragmentary returns. . . . Money values two and a half centuries ago were five or six times those recognized by us.

"President Quincy states the number of books in Harvard's library, from the list in the college archives, as two hundred and sixty volumes, rich in the best works of classical and other literature. Another account puts the number at three hundred and twenty volumes. All but a single volume were burned in the destruction of Harvard Hall, in 1764. Though many of John Harvard's contemporaries, who, though he had been so short a time in this country, must have known something of his personal history, — speak gratefully of his generous gift, — not one of them has left for us the slightest information of facts which we should be glad to know of this youthful, delicate scholar, fading away of consumption early in the second autumn of his exile.

"In that precious relic of the press, called '*New England's First Fruits*' printed in London, 164-, we read that while the colonists in Boston were earnestly intent in their first struggles to make provision for learning and to avert an illiterate ministry, 'it pleased God to stir up the heart of one Mr. Harvard (a godly gentleman and a lover of learning there living among us) to give the one half of his estate, it being in all about £1700, towards the erecting of a college, and all his library.' While the descendants of large numbers of the earliest New England colonists, whose genealogies have an interest only for their own families, have easily traced their localities and lineage in the mother country, all efforts — and they have been many and earnest — spent upon the subject of my remarks have wholly failed of rewarding results. Your predecessor in the chair, Mr. President, the keen, sagacious and unwearied Mr. Savage, — our chief in the labors of research, — failed to accomplish in the case of Harvard what he did for so many other of our worthies. We recall the fervor of his utterance here when he spoke, as he has published in print, to the effect that he would give a guinea for each word, or a hundred dollars for each of five lines, of information about John Harvard in England."

ST. JAMES'S CHURCH, CORNER SEVENTY-FIRST STREET AND MADISON AVENUE, NEW YORK, N. Y. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

This church building was completed in January of this year as shown by perspective, with the exception of the belfry stage of tower and lantern of same. The material employed throughout the exterior is Longmeadow stone of two slightly varying shades, the ashlar being rock-faced and the finish dressed. The seating capacity of the church is 950, including the accommodation of the rear gallery. The Sunday-school room is provided for in the basement, which is also arranged for special class-rooms, choir-rehearsal rooms, etc. The necessary guild and society rooms are in the wing, as indicated on the plan. The cost of the building complete was $130,000. It is proposed to complete the tower as drawn, at an early date.

THE CATHEDRAL, COLOGNE, GERMANY. AFTER AN ETCHING BY B. MANNFELD.

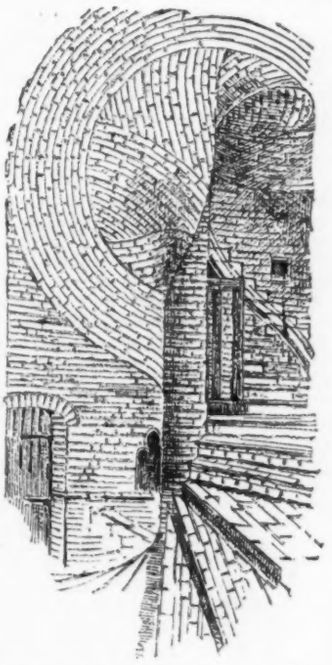
On Saturday, August 15, 1880, the cap-stone of the last of the west towers to be completed was set in place, and on October 15 and 16 of the same year was held a great festival during which the building which had been for so many centuries in the hands of the builders was finally dedicated to the service of God. The history of the building and all that relates to the completion of the towers and other unfinished portions has been so often referred to of late years that it is not necessary to go over the ground again.

THE TOWN-HALL, YPRES, BELGIUM.

[Gelatine Print, issued only with the Gelatine Edition.]

This building, which was begun about 1230, and was in the hands of the builders something over a hundred years, or until 1342, was formerly the guild-hall of the great guild of the clothiers, one of the strongest of the great merchant associations of the Netherlands, and is still known as the "Cloth Hall." It is built of brick, and is 436 feet long. The Renaissance structure on columns at the east end was built about 1730. The main façade is decorated with forty-four statues, in couples, representing the Counts of Flanders down to the time of Charles V. These were restored about twenty years ago.

ON STAIRCASES.



The first of two lectures on this subject was delivered on the 2d ult. to the students of the Royal Academy, by Mr. G. Aitchison, A. R. A., who said that the history of stairs and staircases might be interesting from an antiquarian and ethnological point of view, but here it was the practical question of how they could be made better and more beautiful than heretofore. The steps found in the rocks probably suggested to some pre-historic genius an easy means of conquering steepness. That steps were known at an early time was shown in the rock-cut temples of Egypt. The chronology of Egypt professed to begin 3,900 years before our era; the kingdom of the Pharaohs dated from 1830 to 1312 B. C., and it was to the latter period that the rock-cut tombs with steps and the staircases in the Palace of Rameses belonged. The Chaldean temples, too, were supposed to have had grand flights of steps. The early chronologies were somewhat vague, some giving the date of 1635 B. C., other 1571, and even 1312 B. C.,

as the date of the birth of Moses; when steps were first mentioned in the Bible it was after the flight from Egypt. Whether Jacob's Ladder was a flight of steps, or a ladder, he would leave the learned to decide.

Solomon's birth was said to have been somewhere about 1000 B. C., and they read that when the Queen of Sheba had seen the house which he had built, "and his ascent by which he went up into the House of the Lord, there was no more spirit in her." Then, as now, the employer, and not the architect, got the credit! Persia was probably the country where flights of magnificent steps were principally to be seen, evidently used to give dignity and impressiveness to the buildings. Those in front of the great walled plateau of Persepolis were 34 feet high. The palaces of Darius and Xerxes had very fine staircases, which preceded but a little those to the Propylæa on the Acropolis, which must have been the most magnificent in the world. The vestibule at the top of these stairs was splendid and unique amongst Greek buildings; that is to say, amongst the most perfect architecture the world had seen, and which deserved some mention beyond the immediate purpose of the lecture. It was building at the very acme of Athenian taste, and was looked on as the personification of Athenian supremacy. It was considered the gem of Atheas, and united at once the most perfect simplicity, the greatest subtlety of composition, and the greatest originality of any Greek building that had come down to us. Placed on the crag platform of the Acropolis, it was the main feature of Athens, its stairs conferred imperial beauty on it, and gave dignity to the columns of its portico. Mr. Penrose had shown conclusively that the flanks had no pediment. Within the central portico and at right angles to it was a double row of Ionic columns, flanking the carriage-way. We have reason to wonder that such noble works should have been built in so short a time. Plutarch, writings 500 years afterwards, says "even now they have the freshness of modern buildings, and a bloom is diffused over them, as if they were animated with a spirit of perpetual youth and unfading elegance."

By referring to Vitruvius they would find the way in which steps should be made. At the Propylæa and in other Greek temples there was a chase cut out on the bottom of the riser, and another on the back of the tread; the chase looking as if it were cut to catch the rain-water, when the rain ran down the riser; it was apparently caught by this channel. Mr. Penrose found there was no exit to these, so that after rain the channels were full of water. There were some curious points about these channels, some being worked on the riser, and some on both the tread and riser. His hearers might doubtless think that this would be more interesting to the mason than to the architect; still these matters were not so trivial, particularly as the material used was costly marble, and the superfluous marble left, which the chases marked, was to protect the face and edges. They might say that they could not be roused to enthusiasm about steps, but he would try to persuade them that much might be learned from such humble accessories. Was it not possible that these sinkings were found to give accent to the stages, and were eventually used for æsthetic purposes? The beauty of stairs depended on good proportion and the realization of proper effect; the hand of a master could be traced in the smallest detail of a building. If the mouldings of a building were coarse and ill-proportioned it could be seen that the architect was a savage, although he might be a clever one. In the case of steps, when the treads were too narrow, the whole flight rose up before one like a wall, while, if the risers were too low, the lines which were the beauty of the steps were lost.

When he first thought of this lecture he believed he had merely to go to the Institute or the British Museum Library to get full details of every flight of steps or grand staircase he had seen; but it was almost like digging for diamonds on Salisbury Plain! One example that had struck him as being most important, the *scalinata*, was not to be found, nor were there any details of those two grand staircases, —the one at the National Gallery and the other at the Royal Academy, when both were housed at Trafalgar-square. Nor was a plan of the staircase of Santa Maria in Ara Cœli to be found. If the competitors for the Silver Medal could be set to work on the great buildings of England, and if their drawings could be published or preserved and bound, what an important gallery of English architecture the Academy would possess! External staircases presented infinite possibilities of display, as one was not hampered by want of space or the fear of spoiling the interior arrangements of the building. The *scalinata*, or grand flight of steps, at Santa Trinità dei Monti in Rome, was certainly superb. It consisted of one grand straight flight with three landings, divided into three by square pedestals, the central portion being about three-fifths of the whole width, and above circular flights, the whole being crowned by the two-towered church of Santa Trinità dei Monti. Sir John Soane had evidently taken from this his suggestion for a Scala Regia, published in his work. Another splendid staircase in Rome was that leading to the Church of Santa Maria in Ara Cœli, built in 1348. However inferior in position this staircase might be, it to some extent suggested the magnificence of that to the Propylæa. Though the staircase at the Ara Cœli was not nearly so magnificent as the *scalinata*, it was, perhaps, more striking on account of its perfect simplicity. The art in the other was only too apparent, while the highest art was to conceal it. Every architect who looked at a perfect Doric temple must wish that he had lived before the Greeks, feeling sure that he would have done it in the same way. It looked so simple that it would seem as if he could have fallen on no other form than sublimity. In the same way, on first seeing the inside of the Pantheon one was almost angry with the nameless architect who had lighted the vast dome by a single eye, before one had the chance of doing so. He wished to impress on his audience the advantage of the infinite pains which must be taken, and of the self-denial to be exercised, if they hoped to produce the highest work which should live.

Perhaps the most historic open-air staircase was that of the Giants at Venice. This *Scala dei Giganti*, with its two colossal statues of Mars and Neptune, was not the place of execution of the Doge Marino Falieri, as it was not then built. This staircase was a little over 13 ft. wide, and consisted of twenty-eight marble steps, with landings in the middle and at the top. In Mediæval times a large proportion of the staircases was in the open air, built on to or corbelled out from the wall, like that of the Bargello at Florence. There was a very fine flight of the same sort at the Courts of Justice in Barcelona. This was a wide flight, like that of the Bargello, and at the top where it entered the arcade which surrounded the courtyard, the angle column on which the two arches would rest was suppressed, and there was nothing but a boss. Viollet-le-Duc gave a representation of an outside staircase leading to the ramparts at Carcassone, which was of interest. The lecturer drew attention to several examples, of which drawings were displayed on the wall. One was an open-air staircase, with a pretty open-work Gothic balustrade, probably from Nuremberg. Another was a view of the Ripetta at Rome, showing a series of three steps and a landing,—a double curve on plan. These had been swept away by the foundations of a new bridge. The President had kindly lent him a sketch of the summer pulpit at Jerusalem, and on the wall was a drawing of the celebrated staircase in the cathedral at Burgos, lent by Mr. O'Connor, which had so great a charm for painters. It was an inside staircase, with many of the features of an outside one. In Canterbury Cathedral would be found a noble flight of steps leading from the transept to the choir, which would have been effective if it had not led to a dead wall. And here should be named Sir Charles Barry's magnificent stairs in Westminster Hall, stretching nearly across it. Nearly every considerable church or cathedral, both at home and abroad, has, or has had, a more or less imposing flight of steps. The fine open-air staircases of England were mostly to be found in the gardens and terraces of the Tudor and Elizabethan age. Sir Charles Barry was very successful with this form of garden and terrace staircase. In Italy there were numerous specimens of stairs in gardens and terraces.

Before going farther he would like to draw attention to the splendid flight of stairs by Wilkins to the portico of University College, London. This was well worth studying, and any who were looking forward to doing grand public buildings should spend some time in measuring it, and seeing how the grand effects were produced. To get these effects required commanding genius and severe study. The first point to be observed in arranging steps and staircases was the proportion which would make them look well, and yet would not prevent their convenient use. This was done by making the risers shallow and the treads wide. Breadth was also of the first importance. Splendid specimens of staircases in gardens and terraces were to be found about Rome and its environs, and J. Gwilt was of opinion that the stairs at Versailles showed magnificence and artistic skill. Any one could now consult books on the subject, but there were so many points that even the best views would not give, that it was rash to speak of effects until they had judged of them with their own eyes. He would like, however, to refer to the beautiful garden and architectural effects of the Villa d'Este, near Tivoli. There was one rule which should not be lost sight of in outdoor steps,— that of giving each tread a slight fall to the nosing, so that the rain-water might run off. He never walked on the grand pier at Brighton without thinking what a fine street could be made from the square to the heights above, finishing with a grand flight of steps, and crowned with some cathedral, town-hall, or museum. He was afraid that Londoners would have to wait for the crowning of their "Mons. Sacer," Primrose Hill, with a grand flight of steps and a pulpit for addressing the people, before they could hope to rival the Propylæa at Athens or Santa Trinità dei Monti at Rome.

Mr. Aitchison's second lecture was delivered on Friday, the 6th ult. Mr. Aitchison said that staircases might be divided into the following classes; first, the cockle, corkscrew, lantern, winding or newel staircase, sometimes called a vyse; second, the straight staircase between two walls; third, those which went round two, three, or four sides of a rectilineal figure; fourth, a central ascent with two branches, etc.; fifth, the circular, semicircular, or oval well staircase; and, sixth, the compound staircase, with straight flights in conjunction with curves, etc. Properly speaking, the word "staircase" implied its own use, namely that of a case, but, as was well known, a long flight of stairs out of doors would be called a staircase. Staircases were important features in buildings, as they presented opportunities for all that the architect, sculptor, and painter could do in the way of adornment, and also for the effects due to light. Lighting from the whole ceiling, vault, or dome was the best, and there was a gravity and uniformity about this mode which caused it to surpass all others. The next best plan was by a lantern, but, if this were adopted, the vertical windows must be ample. Windows on the stairs or landings were dazzling to the eye, but a fine method of lighting was by recesses lighted from the top and partly from the sides, and

screened from sight. Winding stairs were used throughout the Middle Ages, and captivated the leaders of the Renaissance. M. Viollet-le-Duc gave some examples of corkscrew stairs, and notably one from Mayence Cathedral. The celebrated screw staircase at the Louvre was another fine example.

Mr. Aitchison then described the central staircase at Chambord, and also that in the court-yard of the Castle of Blois. A Greek, in the age of Pericles, would have considered this staircase barbaric, but its depth of shadow and relief conferred boldness and originality upon it. Inside, the newel had a moulded skirting, and was divided above into panels by slender shafts, the panels enriched with delicate arabesque. The staircase at Chambord, since the floors of the great hall had been removed, had a most surprising and astounding effect. One seemed to be in a lofty cathedral, with a piece of tabernacle-work rising up through the roof. Though this staircase was not so rich as that at Blois, it was still very effective, and its fame even reached the ears of Palladio, who mentioned it in his book, though he thought it was a well-staircase, and had four staircases rising one above another, instead of its being a newel-staircase, with two stairways like those by Mr. Bodley at the School Board Office.

Another celebrated circular staircase was the Scala Minelli, at Venice. In the leaning tower at Pisa the winding staircase went spirally up between the inner and outer walls, and, though devoid of ornament, was very striking. The great drawback of these newel-staircases was the want of vista, and the truly royal staircase was the straight one. Of these he would mention that of Bernini at the Vatican, which had been managed with the most perfect art. The great objection to a columned staircase was the raking of the vault, which looked unsafe and unpleasant. Sir John Soane was aware of this fact, and in his royal staircase he got his vaults springing from a horizontal line by keeping the stairs within the stylobate. He must not omit to mention the Scala Santa, or holy staircase, of St. John Lateran, said to be the stairs of Pontius Pilate's house. It consisted of twenty-eight marble steps cased with wood, and a two-story building was erected to take this staircase, with four other staircases, to meet the wants of the faithful.

The Norman staircase leading to the school at Canterbury was a type of a common form used in the Middle Ages. It consisted of four large Norman columns, each with a square abacus; a wall about two-thirds of the height of the columns ran up on the rake, and was capped with a plain projecting coping. The shafts diminished in height as they went up the slope, so that their capitals were level, and the whole was covered with a pent-house roof. He was very much struck with this when he first saw it, and his admiration had not diminished with time; indeed, it was one of the most effective small out-door staircases he had ever seen. The Normans were great architects and sculptors, and it seemed a pity that so much of their sculpture had been restored by those ingenious persons who should carve comic pipe-heads and umbrella-handles.

In the third class he would mention Sir Charles Barry's staircases at the Reform Club and Bridgewater House, going round three sides of a square between walls. Mr. Ewan Christian wished him to remark that in every house a staircase between walls should be built, as it was the only fire-proof staircase, and would save life in case of fire.

Mr. Aitchison then drew attention to some drawings of the celebrated staircase by Inigo Jones at Ashburnham House, and of which Sir John Soane thought so highly that he had drawings of it specially made for his Academy lectures. From the inner hall, a low, plainly-panelled room, about seventeen feet by twenty-three feet, the visitor passed up a flight of ten steps in the middle of the west wall, and was landed in the staircase-hall, where three more steps took him to the foot of the grand staircase. He then found himself in an elegant hall, about twenty feet high, twenty-seven feet seven inches long, and fourteen feet wide, with two windows at his back. The walls on the first-floor level were ornamented with Ionic pilasters. At the top of the stairs was a recess of about fifteen feet by seven feet six inches, the lines of the hall being preserved by two engaged columns and an isolated one in the middle, its pedestal forming that of the balustrade. The hall had a coved cornice, and in the centre of the ceiling was an oval lantern, domed at the top, supported by twelve Ionic colonnettes, grouped together in threes, and with balustrades between the groups. The grand staircase had but seventeen steps: one flight of nine, then a square landing, and then another flight of eight landing in the line of the columns forming the front to the recess. The landing in this recess, about seven feet six inches square, gave access to the dining-room and ante-room. The first flight was five feet eight inches wide; the second about seven feet; the risers being five inches high, and the treads fourteen inches wide.

It was difficult, even with the drawings, to convey the full effect of the art and ingenuity displayed. The low, plain inner hall acted as foil to the elegance and proportion of the staircase hall. The twelve feet six inches of height to the first floor, gained by thirty steps, was half cut off insensibly by the steps from the inner hall, and the three to the staircase floor. He doubted if anything so original as the lantern existed. It was constructed in a common hipped roof, tiled, and with four dormers, and no one looking at its external homeliness would guess at the elegance within. There used to be elegant staircases in some of the old city houses, but these had been swept away to make room for modern tasteless rubbish, built on the leasehold system. He hoped that some day the Academy would acknowledge the claims of architecture, and would extend its liberality to endowing a Professor of Construction, and thus remove the present reproach that the schools turned out draughtsmen and scene-painters, but not architects.

The Palazzo Braschi at Rome contained a celebrated staircase going round three sides of a parallelogram, with a well in the middle. The stairs were about ten feet wide, and the hall was lighted by three windows on one side, by windows in the cove, and a small sky-light in the top. One point which had never been conquered in this kind of staircase was the distortion of the arches, but still this one was a striking example. There was a similar one at Naples. The architectural details were poor, but the corridors had their windows facing the street, and when he saw it, on coming from London, it struck him as a fine and original work.

One of the finest staircases he knew was that of Christ Church, Oxford. A straight flight led to the hall, a few steps taking one to the Cathedral Close, another flight going to a small quadrangle, and then came the kitchen. ⌐¬ staircases were without number; this was a central flight with branches to the right and left. One of the finest in London was that of Stafford House, where the flights went round three sides of a magnificent hall with columns and corridors. The twin flights, however, had a parasitic look, like vines on an elm, and this was peculiar, as the general fault of such staircases was that all view of the cage above was obscured, so that it was sacrificed at the very moment when it should be most prominent. When magnificence and not economy of space had to be considered, these second flights should be enclosed between walls, with double rows of columns and corridors.

The bridge staircase was to be seen to perfection in the Comédie Française at Paris, and here the lecturer exhibited a drawing of the staircase of the Paris Grand Opera, designed by M. Charles Garnier, adding that the whole of this magnificent building afforded an example of revived Classic, sweetly proportioned and yet distinctly French. Of the oval and circular staircases, a well-known example was that of the Palazzo Barbarini, with a riser of four inches, and a tread of one foot seven and one-half inches. There was also a circular staircase in the building of the Belvedere at the Vatican, the well being formed of eight single columns to each story: Tuscan on the lowest, and then Doric, Ionic, Corinthian and Composite. Sir William Chambers had a semicircular hanging staircase in one of the wings of Somerset House, facing the Strand. This was well worth looking at, and showed how a beautiful plan might produce a bad effect. The worst feature in it was the landing in the middle, making an ugly break in the spiral lines.

Probably one of the most extraordinary compound staircases in existence was that designed by Michael Angelo for the Lorentian Library. It went from the hall to the upper library, and consisted of a central flight on the bevel with fifteen risers, and with a staircase on either side. The steps curved forward like a bent bow with hobs at each end, and we could hardly understand for what purpose these hobs had been made, except for appearance. It was an extremely effective staircase, and quite different from anything he had seen in any part of the world.

Another very splendid compound staircase was that of Buckingham Palace, by John Nash. From the hall a flight of eight steps led to a landing lighted by a screened side window; nineteen steps led to the next landing, well lighted from above, and then four steps and a landing and twenty-two more steps between walls, adorned with columns, led in one line to the gallery-door. Had the exigencies of the building permitted, it would have been better to have had a landing to the gallery-door, lighted from the top, like that in the Royal Academy. The balustrade was very handsome, being of gilt iron-work. At the second landing from the bottom, two curved twin flights led to a landing and balcony over the entrance to the staircase; this part was domed over with a flat dome and pendentions. The central dome was of ground-glass, with slight bars of metal, the central part being in the shape of a star. This beautiful staircase was well worthy of notice: when a lad he had been very much struck with it, and he had admired it again the other day.

He would like also to call attention to the staircase in the Royal Academy. The soffits of the upper stairs were moulded and had a good effect, and rather intensified the lines of the lower stairs. The stairs, which were eight feet above, swelled out as we got to the landing, and were ten feet at the bottom, and came down well between the coupled columns. The flight between the large Devonshire marble columns had the light from above. In the case of the grand staircase at Versailles the visitor came up a straight flight in front, with twin staircases right and left. The first flight was square, with the angles cut off. The staircases were about ten feet wide. The first floor had Ionic pilasters all round the cage.

He must not omit to mention Wilkins's staircase at Trafalgar Square, when the National Gallery and Royal Academy were under one roof. Illustrations of this might be seen in Leed's "*Public Buildings of London.*" The entrance was by a central hall lit by windows at the end; the side walls were kept low, with Corinthian columns on them and a balustrade between, and the stairs to the National Gallery and the Royal Academy were opposite the centre and in two continuous flights, so that when you turned round on reaching the first floor, you could see the persons ascending on the other side. It had a magnificent effect, and it was much to be deplored that it had been pulled down and other commonplace staircases put up in their place merely to save a little room. This might be all very well in the case of private mansions, but was a scandal in the

matter of public buildings. The National Gallery had many splendid points about it, and a great deal of that which was complained of was forced upon Wilkins against his will. He was, amongst other things, compelled to force back the angles so that one end should not interfere with the view of St. Martin's Church.

Mr. Aitchison added that he had a good many photographs of more or less celebrated staircases exhibited on the wall, but it was impossible to name all the fine staircases in the world. Had he done so, the lecture would have been a mere catalogue. He had been compelled to omit all mention of the fine staircases at Genoa, where the whole ground-floor of some of the palaces seem devoted to their display. Then there were the splendid ones in some of the London halls, and those of F. P. Cockerell, one at the Royal Society of Painters in Water-Colors, and one which that architect sketched out, and which he (the lecturer) finished, in South Audley Street. He had been unable to speak of the fine Elizabethan staircases and many of those designed by Inigo Jones.

In conclusion, he would urge that in almost every tolerably-sized house, where the principal rooms were on the first floor, greater attention should be devoted to the staircase than had been paid within the last twenty years. The magnificent examples shown on the walls would not, he hoped, be without some effect on the works his hearers might hereafter execute.

SOME SUGGESTIONS.

To the Editors of the American Architect: —

Dear Sirs, — Your ever more valuable paper contained some time ago an article on "Helps" which doubtless expressed the sentiments of many of your busy readers. In the interests of those who thoroughly appreciate the value of systematic study, I would like to ask a number of favors.

1. That with each volume of the *American Architect* you issue two copies of the index; one copy to be bound with the letter-press, and the second to be preserved with other extras in a patent binder.

2. That the index to illustrations be printed only on one side of the paper, so that the part belonging to the extra copy can be cut up and pasted in the portfolios of classified cuts, and the index by location in the "Excursion Book."

3. That you will furnish for a moderate sum, muslin-covered portfolios (very light) with tapes and blank title card. The portfolios to be not over one and one-half inches spread.

4. That whenever demand will warrant such an experiment, you will issue the *American Architect* in leaflets with only one article on a leaf. The increased bulk would be more than compensated by the increased usefulness, and if it were a special edition issued before the other, the increased expense could be borne by those only who were willing to subscribe to it.

Hoping you will attribute these suggestions to my intense appreciation of your spirit of progress, and thanking you sincerely for the promise of the "Monographs," I remain, etc.,

B. B. B.

[We are glad to receive these suggestions, and will always welcome any hint as to ways in which we can make our journal of more practical usefulness to its readers. While we cannot promise to act on all suggestions sent us we will go as far as we can to meet all that are reasonable and practical. — Eds. American Architect.]

A BOOK ON STEAM HEATING.

New Deaf and Dumb Institute,
Council Bluff, Iowa, April 8, 1885.

To the Editors of the American Architect: —

Dear Sirs, — Will you please tell me where I can get a good book on mechanical and steam-heating engineering.

Yours truly, T. K. Winter.

[Write to John Wiley & Son, for W. J. Baldwin's "*Steam Heating for Buildings or Hints to Steam Users.*" — Eds. American Architect.]

"THE SANITARY NEWS."

Princet n, Ind.

To the Editors of the American Architect: —

Dear Sirs, — Please inform me if there is a paper published at Chicago, Ill., by the name of *Sanitary News.* I believe the editor is Mr. Clark. State the name of office.

Yours respectfully, Thomas Brown.

[The *Sanitary News*, edited by Mr. G. P. Brown, is published at 113 Adams st., Chicago. The subscription is $2 per year. — Eds. American Architect.]

CORRUGATED WIRE-LATH.

New York, April 1, 1885.

To the Editors of the American Architect: —

Dear Sirs, — In a recent issue you mention wire-lath, corrugated to save furring; will you kindly give name of patentee or maker — something by which it can be exactly specified — and gratify

Constant Reader.

[The Stanley Corrugated Fireproof Lathing Company, 239 Broadway, New York, now makes the lathing referred to. — Eds. American Architect.]

NOTES AND CLIPPINGS.

The Cypress of Santa Maria del Tule, Mexico. — Somebody in writing of old trees says some have been found in Africa that are computed to be 5150 years old, and a cypress in Mexico is believed to have reached a still greater age. The cypress of Santa Maria del Tule in the State of Oaxaca is probably the oldest individual of any species on the globe. If estimates of tree ages are to be relied upon, the life of this venerable forest monarch may have spanned the whole period of written history. At last accounts it was still growing, and in 1851, when Humboldt saw it, it measured 42 feet in diameter, 146 in circumference, and 382 feet between the extremities of two opposite branches. — *Boston Journal.*

The Pneumatic Despatch in New York. — The Western Union Telegraph Company, in New York City, are about to substitute pneumatic tubes for the distribution of city messages. Brass tubes three inches in diameter have been laid four feet below the surface. The leather cases for messages are to be impelled by compressed air at one end and with vacuum on the other, at an estimated velocity of about a mile per minute. At the terminal stations are four engines, eighteen inch by thirty-six inch cylinders with compressors or exhausters tandem with the cylinder, developing two hundred and forty horse-power each, at eighteen revolutions per minute. Air is exhausted from one reservoir, and compressed to thirty pounds per square inch in the other. The pumps and connections are so arranged that any of them can be used either for compression or exhaustion to either reservoir. The Company have used short pneumatic tubes to some newspaper offices and to different departments for some time, but the plant now in process of construction will contain many novelties of detail in respect to facilities for sending and receiving messages from branch stations, construction of expansion joints, and convenience of operation. — *Engineering.*

The Irrigation Canals of Northern Italy. — Few of the many travellers in North Italy give heed to the wonderful system of irrigation canals in Piedmont, which yield 125,550 gallons of water per second, distributed over 1,630,400 acres of land, while those of Lombardy yield 95,355 gallons over 1,680,400 acres. The Cavour Canal, constructed within the last few years, draws its supply from the rivers Po and Dora Baltea, and has a flow of 29,200 gallons per second, watering 40,000 acres at a cost of £32,000 per mile, or a total of £1,600,000. Its volume is now to be increased by 5,300 gallons per second. A smaller subsidiary canal gives 18,540 gallons per second, and cost £24,154 per mile. The canals in this district are not only used for irrigation, but also for motive power, by which the water is raised to higher levels. On the steep slope of the Dora Baltea, near Turin, three canals — the Torea, Agliano, and Rothe — flow parallel to each other, though on different levels, the water of all these being used at the top of the hill, 62 feet above the highest of them. A stream of 154 gallons per second is diverted from the Torea Canal, and carried down the hill by a lead pipe, until it meets the Agliano Canal. Here it is pumped up to the summit level by eight pumps, worked by four turbines driven by a fall of water taken from the Agliano, and allowed to fall into the Rothe, by joining which it is available for irrigation. By this means not a drop is wasted. The Italian engineers have gone on the principle of constructing the works on a vast scale, so as to have everything on a uniform arrangement, and avoid constant alterations, and by this means they have succeeded in utilizing every drop of water, and making North Italy a marvel of fertility.—*The Builder.*

Another Ingenious Swindle. — One of the most expert speculators in Vienna is a man named Heinrich Kuffler. Over there, however, they with brutal frankness, call such men swindlers. Some of his late tricks are so good that even Jay Gould might take lessons from him. The Austrian speculator is fully up to Mr. Ward, on a smaller scale, however. Not long since, Kuffler appeared in the office of a wealthy lumber-dealer who owned an immense lumber-yard in the heart of the city. At this time there was a perfect mania for building houses in Vienna, and available lots commanded fancy prices. "I want to buy the land you have got your lumber-yard on. I want to put up a big hotel on it," said Kuffler. "I don't care to sell." "But I have got to have it. It is the only suitable place in this part of the city. I'll give you half a million." "I don't want to sell. I would not sell for a million." "I will give you a million." The lot was not worth a million, but as the merchant had his lumber on it, and was wealthy, he did not care to accept the offer. "No, I would rather not." "I'll give you a million and a quarter, and to show you that I am in earnest, I'll put up fifty thousand marks forfeit. I must have a big lot on which to put up my new hotel," said he, placing that amount in thousand-mark notes on the table. The poor lumber-dealer became nervous and excited. Great beads of perspiration stood on his brow. He asked for twenty-four hours to think about it. The trade was then concluded. The lumber was to be cleared away before two months. The fifty thousand marks forfeit were to be paid over at the end of a week. The lumber-dealer was satisfied on that point. He knew Kuffler had the money. The lumber-man then proceeded to hunt for another lumber-yard. Suitable vacant lots were extremely scarce. A land-agent, however, who had heard that the lumber-dealer was looking for a lot, offered him one for six hundred thousand marks, but only gave him the refusal of it for twenty-four hours. He said he could get that amount from another party. In his anxiety to sell the place to Kuffler for a million and a quarter, the lumber-merchant paid down six hundred thousand francs to the agent. Next day Kuffler notified the lumber-dealer that he would pay over the fifty thousand marks forfeit, as he was unable to raise the million and a quarter, the purchase money for his lot. With the aid of a skilful agent, the speculator had sold to the lumber-merchant for six hundred thousand marks a lot only worth four hundred thousand marks, thereby profiting, after paying the fifty thousand marks forfeit, a cool 150,000 marks. The lumber-merchant has now two lots on his hands, and is also in possession of considerable experience. — *Siftings.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

315,467. WATER-CLOSET. —Louis and John Brandt, New York, N. Y.

315,471. ROOF-PAINT COMPOSITION. — Daniel Brobst, Portland, Mich.

315,474. SASH-HOLDER. — Frederick H. Bultmann, Cleveland, O.

315,487. COMPOSITION MASTIC FOR COVERING ROOFS, TELEGRAPH-WIRES AND THE LIKE. — Andrew Derrom, Paterson, N. J.

315,522. VENTILATOR.—Charles B. Loveless, Worthington, Minn.

315,533. SASH-BALANCE. — Thomas Morton, New York, N. Y.

315,545. DRAWING-BOARD AND T-SQUARE. — Clifford H. Prescott, Lawrence, Mass.

315,557. ARTIFICIAL FLAG-STONE. — Augustus S. Sampson and Daniel G. Peck, Minneapolis, Minn.

315,580. SHUTTER. — Horatio O. Whyman, Norfolk, Neb.

315,584. ROOFING COMPOSITION OF TAR, CEMENT, ETC. — Karl Wildhagen, Treseburg, Brunswick, Germany.

315,608. STONE-SAWING MACHINE. — John H. Frenier, Rutland, Vt.

315,617-618. FOLDING CHAIR OR SETTEE.—Herbert J. Harwood, Littleton, Mass.

315,621. ADJUSTABLE STOP FOR CALIPERS.—Irving L. Holmes, Providence, R. I.

315,634. ELEVATOR. — David Kennedy, Detroit, Mich.

315,641. BURGLAR-ALARM. — John H. Luebsen, St. Louis, Mo.

315,652. COCK FOR HOUSE SERVICE AND STREET-WASHER CONNECTIONS.—John Moss, Brooklyn, N. Y.

315,657. DOOR-LOCK. — Floyd N. Perkins, Bellefontaine, O.

315,663. SAW. — Christopher Richardson, Newark, N. J.

315,679. LIGHTNING-CONDUCTOR. — Francis R. Upton, Orange, N. J.

315,681. SHUTTER-BOLT. — John Von Hollen, Charleston, S. C.

315,711. MANUFACTURE OF HYDRAULIC CEMENT. Robert Bryce, Louisville, Ky.

315,718. DOOR-CHECK.—Jas. W. Callaway, Temple, Tex.

315,720. SCAFFOLD-IRON. — Andrew H. Campbell, Philadelphia, Pa.

315,722. SHINGLE AND SIDING GUAGE. — William H. H. Campbell, Wichita, Kans.

315,726. EXTENSION-TRESTLE.—Henry H. Childers, Louisville, Ky.

315,734. SAFETY-ATTACHMENT FOR ELEVATOR-CARS. — Philip Cohn, Nuevo, Laredo, Mexico.

315,748. BOLT.—Jas. J. Devine, Philadelphia, Pa.

315,761. SLIDING-DOOR LOCK. — William Gerwien, Chicago, Ill.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report thirty-five permits have been granted, the more important of which are the following: —

U. S. Firor, 3 two-st'y brick buildings (square), w s Wilmer Alley, n of Smith St.

Geo. W. Donahue, 16 two-st'y brick buildings, n s Preston St., w of Belair Ave.; and 7 two-st'y brick buildings, w s Belair Ave., commencing n w cor. Preston St.

Thos. H. Blick, 7 two-st'y brick buildings, e s Holbrook St., s of Hoffman St.

Patrick Hibbitts, three-st'y brick building, s s Baltimore St., between Carey St. and Carrollton Ave.

L. P. Haslup, four-st'y brick factory, 30′ x 33′, w s Norris Alley, n of Baltimore St.

Cass & Bros., four-st'y brick building, s s Baltimore St., between Paca and Greene Sts.

J. T. Fahey, 6 two-st'y brick buildings, e s Fulton St., n of McHenry St.

Frederick Burger, 12 two-st'y brick buildings, e s Falls Alley, between Federal and Lanvale Sts.; and 4 three-st'y and 6 two-st'y brick buildings, w s Barclay St., between Federal and Lanvale Sts.

Jesse F. Ely, three-st'y brick building, w s Richmond St., between Tyson and Howard Sts.

Francis McCann, 6 two-st'y brick buildings, w s Rose St., s of Eastern Ave.

E. J. Cromer, 5 two-st'y brick buildings, e s Valley St., n of Preston St.

Jos. Matthews, three-st'y brick building, e s Front St., between Fayette and Low Sts.

F. Portugal, three-st'y brick building, n s Bank St., between Washington and Chapel Sts.

Jas. Doyle, 2 three-st'y brick buildings, w s Jasper St., n of New St.

Frederick Hertel, 5 two-st'y brick buildings, commencing n e cor. Eagle St. and Addison Alley, fronting on Eagle St.

Boston.

BUILDING PERMITS.—*Brick.* — *West Newton St.*, near St. Botolph St., 2 dwells., 21′ 6″ and 25′ x 47′; owner, L. M. Thompson; builder, Thomas R. White.

West Newton St., cor. St. Botolph St., 2 dwells., 21′ 6″ and 22′ x 47′; owner, G. M. Gibson; builder, Thomas R. White.

Wood. — *Norfolk St.*, near Elizabeth St., poultry-house, 10′ x 20′; owner and builder, N. E. Hallace.

Bodwell St., near Bird St., dwell., 28′ x 32′ 6″; owner and builder, E. McKentnie.

C St., cor. Tudor St., dwell. and bakery, 23′ x 39′; owner, John Arroll; builder, P. F. Hanlon.

Paris St., No. 256, dwell., 21′ x 36′; owner, Michael Powers; builder, J. C. Frame.

Carlton St., near Mt. Vernon St., boat-house, 15′ x 25′; owner, Moseley Hines; builder, J. G. Scott.

Clifton St., near Batchelder St., dwell., 20′ and 36′ x 37′ and 38′; owner and builder, J. Breckenridge.

Walnut Ave., No. 354, cor. Homestead St., dwell., 26′ x 35′ 8″; owner, G. H. Williams; builder, Watson Bowers.

Dorchester Ave., No. 317, dwell., 24′ x 35′; owner and builder, Wm. Peard.

Summit Ave., near Allston St., dwell., 19′ x 28′; owner, Patrick Hassett; builder, Richard Ryan.

East Ninth St., near H St., stable, 25′ x 25′; owner, W. H. Hart; builders, Holbrook & Harlow.

Dorchester Ave., opposite Greenwich Pl., store and shed, 20′ x 30′; owner, John F. Baker; builder, J. H. Wilder.

Dorchester Ave., opposite Greenwich Pl., mechanical, 20′ x 30′; owner and builder, same as last.

Allston St., near Melville Ave,, workshop, 18′ x 25′; owner and builder, J. H. Vinal.

Brooklyn.

BUILDING PERMITS. — *Rutledge St.*, s s, 100′ w Wythe Ave., 2 one-st'y brick valve house and boiler-house, slate roofs; cost, each, $1,200; also, gas-holder tank, cost, $65,000; owner and architect, Nassau Gas-Light Co., Kent Ave. and Cross St.; builder, John McNamee.

Clason Ave., w s, 80′ s Putnam Ave., four-st'y brown-stone tenement, tin roof; cost, $12,000; owner, Alfred Churchman, 66 Putnam Ave.; architect, Amzi Hill.

Duryea St., s s, 125′ e Broadway, 4 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $3,800; owners, Joseph Collins and J. Duneday, 66 Woodbine St.; architect, I. D. Reynolds; builder, R. Healey.

Ivy St., n s, 150′ e Bushwick Ave., 4 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $3,500; owner and architect, James C. Brower, 10 Ralph Ave.

Jefferson St., n s, 150′ w Central Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,500; owner and builder, C. Dehler, Jefferson St., near Evergreen Ave.; architect, J. Platte.

Evergreen Ave., e s, 25′ n Palmetto St., 3 two-st'y frame (brick-filled) dwells., tin roofs; cost, each, $2,000; owner, John F. Ehlers, 310 Stockton St.; architect and builder, W. M. Whitenack.

Tompkins Ave., No. 67, three-st'y frame (brick-filled) tenement, tin roof; cost, $3,500; owner, Mrs. Marie Kaiser, 123 Floyd St.; architect, Frank Holmberg; builder, George Loeffler.

Powers St., No. 115, n s, 125′ w Ewen St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,470; owner, Matilda J. Meehan, 200 Ainslie St.; builder, G. H. Garrison.

Dean St., s s, 230′ e Brooklyn Ave., two-st'y brick dwell., tin roof; cost, $4,500; owner and builder, Arthur G. Stone, 301 Jefferson St.; architect, G. A. Schellenger.

Hancock St., s s, 166′ 8″ w Marcy Ave., 2 three-st'y brick dwells., tin roofs; cost, each, $9,500; owner and builder, G. H. Stone, 301 Jefferson St.; architect, G. A. Schellenger.

Decatur St., s s, 100′ w Reid Ave., 5 two-st'y brick dwells., tin roofs, wooden cornices; cost, each, $3,000; owner, etc., John S. J. King, 1368 Pacific St.

St. Mark's Ave., s w cor. Carlton Ave., three-st'y brown-stone dwell., tin roof; cost, $7,500; owner, etc., John Donovan, 122 St. Marks Ave.

Calyer St., n s, 75′ e Manhattan Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $5,000; owner, Leonhard Burgey, 184 Green St.; architect, H. Vollweiler.

Ellery St., No. 193, n s, three-st'y frame (brick-filled) tenement, tin roof; cost, $4,000; owner, Maria Ziehn, 193 Ellery St.; architect, H. Vollweiler.

Freeman St., n s, 250′ e Oakland St., three-st'y frame (brick-filled) tenement, gravel and cement roof; cost, $4,200; owner, E. Butler, Freeman St.; architect, James Mulhaul; builders, James Doig, Jr., and Gately & Smith.

Woodbine St., No. 74, s s, 275′ e Bushwick Ave., three-st'y frame (brick-filled) dwell., tin roof; cost, $3,200; owner and architect, John B. Wear, 72 Woodbine St.; contractor, R. Right; mason, not selected.

Washington Ave., No. 219, e s, 108′ n Willoughby Ave., three-st'y Portland stone dwell., tin roof; owner, J. Henning Smith, 221 Washington Ave.; architect, Edward C. Smith; builders, Squire & Whipple and Mead & Taft.

Quincy St., s s, 225′ w Marcy Ave., 3 two-st'y brown-stone dwells., tin roofs; cost, each, $4,200; owner, James Kerr, 298 Quincy St.; architect, Fred. D. Vrooman; builder, Wm. Vrooman.

Fourth St., No. 269, w s, 50′ s North Tenth St., four-st'y frame (brick-filled) tenement, tin roof; cost, $6,400; owner, Ellen V. Lawrence, 267 Fourth St.; architect, E. F. Gaylor; builder, John Fallon.

Chicago.

BUILDING PERMITS. — J. Byrne, three-st'y store and dwell., 199 West Twelfth St.; cost, $4,000.

M. J. Livingston, three-st'y store and dwell., 122 Third Ave.; cost, $8,000.

M. Kondzorsky, two-st'y dwell., 657 Dixon St.; cost, $3,000; builder, A. W. Rudnick.

P. Benz, two-st'y dwell., 265 Irving Pl.; cost, $3,000; architect, T. Karls; builders, Kreig & Demuth.

E. B. Sheldon, 4 three-st'y dwells., 52 to 58 St. Clair St.; cost, $15,000.

J. Bordman, three-st'y store and dwell., 2711 Wentworth Ave.; cost, $4,500; architect, J. P. Doerr.

J. F. Mendson, 2 four-st'y stores and dwells., 236 and 238 Halsted St.; cost, $15,000.

D. Marks, 2 three-st'y dwells., 182 and 184 Twenty-fourth St.; cost, $6,500; architect, H. Van Pelt; builders, Gorman & Ethier.

H. P. Nelson, two-st'y dwell., 552 West Superior St.; cost, $2,500; builder, C. Olson.

Framke & Sievers, three-st'y factory, 394 to 398 Hastings St.; cost, $5,000; architect, Wm. Strippelman; builder, Dressel.

J. H. Hull, two-st'y dwell., 789 West Monroe St.; cost, $4,500.

E. L. Smith, three-st'y store and flats, 285 Division St.; cost, $7,000; architect, W. Strippelman; builder, F. Mehls.

J. W. Odell, three-st'y dwell., 560 and 562 Dearborn Ave.; cost, $20,000; architects, Treat & Foltz.

E. W. Kubitz, three-st'y store and flats, 787 Milwaukee Ave.; cost, $4,000; architect, H. Kiey.

L. B. Otis, three-st'y store, 195 and 197 Laselle St.; cost, $20,000; architect, J. V. Wadskier.

R. King, two-st'y addition, 224 and 226 North Union St.; cost, $8,000; architects, Furst & Rudolph.

F. Kruska, three-st'y dwell., 822 Ashland Ave.; cost, $3,500.

F. H. Concal, three-st'y dwell., 445 West Nineteenth St.; cost, $3,500.

J. Konopasek, three-st'y dwell., 298 Twentieth St.; cost, $3,200.

C. Warner, three-st'y store and dwell., 74 Twenty-fifth St.; cost, $8,000.

New York.

RECTORY. — On the n e cor. of Madison Ave. and Sixtieth St., a rectory for the "Church of the Holy Spirit" is to be built from designs of Mr. R. H. Robertson.

STORES. — For Messrs. L. Sachs & Bro.. a five-st'y brick warehouse, iron front, 25′ x 100′, is to be built at No. 26 West Houston St., at a cost of $30,000, from designs of Mr. Richard Berger.

WAREHOUSE. — On the w s of Water St., between Catherine and Market Sts., a three-st'y brick warehouse, 60′ x 110′, is to be built for Mr. C. Garrick, from plans of Mr. J. H. Valentine.

FLATS.—For Mr. John D. Karst, 2 five-st'y brick, stone and terra-cotta flats and stores, 25′ x 78′ 6″, are to be built at Nos. 1872 and 1874 Third Ave., from designs of Richard Berger, at a cost of about $34,000.

For Daniel Tier, 3 five-st'y brick and brown-stone flats are to be built, on the s e cor. of Second Ave. and First St., at a cost of $65,000, from plans of Mr. M. L. Ungrich.

On the s s of Forty-fourth St., between Second and Third Aves., a five-st'y brown-stone flat, 18′ x 76′, is to be built for Miss Mary Taylor, from plans of Messrs. A. B. Ogden & Son.

For Mrs. Davis, a four-st'y brick and terra-cotta flat and store, 18′ x 40′, is to be built on the n w cor. of One Hundred and Twenty-sixth St. and Lexington Ave., from plans of Mr. R. Rosenstock.

BUILDING PERMITS. — *Beach St., Nos.* 53 *and* 55, six-st'y brick factory, gravel roof; cost, $25,000; owner and builder, Joseph Naylor, 107 Duane St.; architect, Oscar S. Teale.

Leroy St., No. 19, four-st'y brick stable, tin roof; cost, $12,000; owner, John P. Nichols, 92 Charles St.; architect, John McIntyre; builder, John F. Moore.

Mulberry St., No. 42, four-st'y brick tenement, tin roof; cost, $10,000; owner, C. L. Wolfe, by James M. Jackson, Agent, 3 Mercer St., architect, Fred. Jenth.

West Tenth St., No. 148, five-st'y brick tenement, tin roof; cost, $18,000; owner, Chas. Guntzer, 22 East Third St.; architect, Wm. Graul.

East Third St., Nos. 302 *and* 304, 2 five-st'y brick tenements and stores, tin roofs; cost, $12,000 and $16,000; owner, Estate A. B. Schermerhorn, Wm. C. Cruikshank, Agent, 111 East Sixty-first St.; architect, Geo. B. Post.

West Sixteenth St., Nos. 409 *and* 411, 2 five-st'y brick tenements, tin roofs; cost, each, $14,500; owner, Philip Malone, 248 West Twenty-second St.; architect, James Stroud; builders, Gillespie & Harlow and J. V. and S. J. Donvan.

West Fiftieth St., No. 530, five-st'y brick tenement, tin roof; cost, $9,000; owner, Wm. Allewelt, on premises; architect, Chas. Neumeyer.

West Fiftieth St., No. 410, five-st'y brick tenement, tin roof; cost, $7,000; owner, Martin Karl, 406 West Fiftieth Sts.; architects, Thom & Wilson; builder, G. A. Zimmerman.

First Ave., No. 972, five-st'y brick tenement and store, tin roof; cost, $10,000; owner, Bernard G. Wenning, 970 First Ave.; architects, A. B. Ogden & Son.

Seventh Ave., e s, 23′ 6″ s Thirty-second St., five-st'y brick tenement, tin roof; cost, $18,500; owner, James J. Morrison, 19 West Thirty-seventh St.; architects, Thom & Wilson; builders, Jacob Vlx & Son.

Pier, foot of Twenty-sixth St., East River, two-st'y frame reception-room, tin roof; cost, $20,000; owner, City of New York, Commissioners Charity and Correction, 66 Third Ave.; architect, N. Le Brun.

Thirtieth St., n s, 275′ e Tenth Ave., 4 five-st'y brown-stone front tenements, tin roofs; cost, each, $8,000; owner, Peter M. Ramsey, Jersey City; architect, J. C. Burne; builder, not selected.

West Thirty-eighth St., No. 321, four-st'y brick tenement, tin roof; cost, $12,000; owner, John D. Hassinger, 319 West Thirty-eighth St.; architect, M. Louis Ungrich.

First Ave., n w cor. Forty-fourth St., three-st'y brick stable and storage-building, gravel roof; cost, $6,500; owner, Patrick Kiernan, President D. Jones Co., on premises; architect, Jos. M. Dunn; builder, Jas. O'Toole.

Seventy-first St., n s, 200′ w First Ave., 5 five-st'y brick tenements, tin roofs; cost, each, $15,000; owner, Jennie S. McDonald, 1532 Park Ave.

Eighty-third St., n s, 110′ w Third Ave., five-st'y brown-stone front tenement, tin roof; cost, $12,000; owner, B. C. Wandell, 159 East Eighty-third St.; architect, D. J. Macrae.

East Eighty-sixth St., Nos. 163 *and* 165, 2 five-st'y brick tenements, tin roofs; cost, each, $23,000; owner, Dr. Valentine Pressler, 105 East Sixtieth St.; architects, Schwarzmann & Buchman; builders, List & Lennon and John F. Moore.

Seventy-second St., n s, 175′ w Ninth Avenue, 5

four-st'y brown-stone front dwells., tin roofs; cost, each, $22,000; owner, Chas. Batchelor, 247 West One Hundred and Twenty-fifth St.; architect, M. V. B. Ferdon; builder, not selected.

One Hundred and Fourth St., s s, 21′ 5″ e Boulevard, 7 three-st'y brown-stone front dwells., tin roofs; cost, each, $12,500; owner, Martha A. Lawson, 524 West Forty-ninth St.; architect, M. L. Ungrich.

One Hundred and Fifth St., s s, 280′ e Grand Boulevard, 4 three-st'y brown-stone front dwells., tin roofs; cost, each, $12,000; owner, architect and builder, John F. Moore, 427 West Fiftieth St.

Seventieth St., s s, 175′ e Eleventh Ave., 3 three-st'y brown-stone front dwells., tin roofs; cost, each, $12,000; owners, Treacy & Van Loon, 242 East Thirty-third St.; architect, J. H. Valentine.

Eighty-first St., n s, 250′ e Ninth Ave., four-st'y brown-stone front dwells., slate and tin roofs; cost, $40,000; owner, Christian Blinn, 400 West Seventy-ninth St.; architect, A. B. Jennings.

One Hundred and Nineteenth St., s s, 65′ e Sixth Ave., two-st'y brown-stone front stable; cost included in last; owner and architect, same as last.

One Hundred and Fifty-fifth St., n s, 350′ w Courtlandt Ave., three-st'y brick dwell., tin roof; cost, $7,000; owner, Mrs. Hannah Wills, 1621 First Ave.; architect, Henry Dudley; builders, Henry Chenoweth and W. Volentine.

Philadelphia.

Building Permits. — *Twelfth St.*, above Huntingdon St., 25 two-st'y dwells., 14′ x 29′; Thornton & Harper, contractors.

North Centre St., No. 3729, 3 two-st'y dwells., 13′ x 25′; Thos. Badman, contractor.

Paul St., n e cor. Meadow St., addition to boiler house, 30′ x 40′; A. Hamilton, contractor.

Carnavan St., above Tasker St., 2 two-st'y dwells., 14′ x 37′; Saml. Young, contractor.

Pennock St., below Brown St., 5 two-st'y dwells., 14′ x 34′; Wm. Charlton, owner.

Thirty-second St., above Spring Garden St., 6 three-st'y dwells., 17′ x 55′; J. H. McIlvain, owner.

Thompson St., above Huntingdon St., 2 three-st'y stores, 20′ x 38′; A. McClay, contractor.

Alamendo St., above Somersett St., three-st'y dwell., 20′ x 31′; A. McClay, contractor.

Main St., No. 4609, shop, 18′ x 32′; J. D. Caldwell, contractor.

Catharine St., e of Fifteenth St., three-st'y dwell., 18′ x 62′; J. McVicar, contractor.

Twenty-fifth St., above Master St., three-st'y store and dwell., 16′ x 41′; J. C. Ruff, contractor.

Wood St., No. 1901, three-st'y store and dwell., 38′ x 42′; Pennock Bros., contractors.

Sixteenth St., below Tioga St., two-st'y dwell., 16′ x 40′; J. L. Tomlinson, contractor.

Sommerville St., and Somersett St., two-st'y dwell., 14′ x 48′; J. L. Tomlinson, contractor.

Merion Ave., w of Forty-fifth St., three-st'y dwell., 16′ x 40′; Thos. Burroughs, contractor.

South Nineteenth St., Nos. 1514 and 1516, 2 two-st'y dwells., 16′ x 39′; Saml. Clellar, contractor.

Seventh St., and Montgomery Ave., church, 66′ x 77′; Martin Helzel, contractor.

Lanson St., above Tenth St., 2 six-st'y buildings, 45′ x 86′; Geo. F. Payne & Co., contractor.

Marsden St., Tacony, 3 two-st'y dwells., 14′ x 28′; W. H. Greenfield.

Broad St., below Washington Ave., addition to warehouse, 20′ x 40′; Herbach & Auchter, contractors.

St. Louis.

Building Permits. — Ninety-one permits have been issued since our last report, sixteen of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

A. Cochran, two-st'y frame dwell.; cost, $3,000; J. H. Havens, contractors.

Mrs. B. C. Taylor, three-st'y frame dwell.; cost, $4,000; J. Strimple & Son, contractors.

Union Depot R. R. Co., one-st'y car shed; cost, $2,800; Helm Bros., contractors.

Thos. J. Furlong, 4 adjacent two-st'y brick dwells.; cost, $10,000; Thos. Furlong, architect; sublet.

J. Merton, two-st'y brick dwell.; cost, $3,325; J. S. Kuhnert, contractor.

R. Mueller, two-st'y brick dwell.; cost, $6,000; P. Ratz, contractor.

Plutner, two-st'y brick dwell.; cost, $3,500; Chas. May, architect, Schildmann & Grosse, contractors.

B. J. Goesse, one-st'y brick skating rink; cost, $2,500; B. J. Goesse, contractor.

G. Bolm, two-st'y brick dwell.; cost, $3,000; E. Jungerfeld & Co., architect, S. H. Schaffner, contractor.

W. Sievers, 2 adjacent two-st'y brick dwells.; cost, $4,000; J. Cairns, architect, W. S. O'Brien, contractor.

J. Hüffner, two-st'y brick dwell.; cost, $3,000; H. Schuermann, contractor.

B. M. Froetz, 2 two-st'y brick dwells.; cost, $6,400; B. M. Froetz, contractor.

W. C. Vasques, 2 adjacent two-st'y brick dwells.; cost, $4,100; J. Conlon, architect; A. Whrl, contractor.

Bids and Contracts.

Washington, D. C. — List of proposals received and opened April 13, 1885, at 2 P. M., by Gen. M. C. Meigs, Supervising Engineer and Architect, for furnishing materials and labor, in laying wooden flooring in first and second story office-rooms of new Pension Building, Judiciary Square: —

I. W. Gartrell & Bond, Washington, D. C., $8,500.

Smith & Smithson, $6,779, thirty working days.

Langley & Gettinger, Washington, D. C., $7,773; thirty working days.

S. H. Morison, Camden, N. J., $7,300; thirty days.

W. Price & Sons, Washington, D. C., $8,490; thirty days.

C. V. Trott, Washington, D. C., $8,047; forty days.

C. Thomas, Washington, D. C., $7,750; thirty days.

Alex. Duehay, Washington, D. C., $8,950; twenty days.

C. F. Adams, Washington, D. C., $9,450; thirty days.

Wood & Augus, Washington, D. C., $9,985; sixty days.

Z. Downing, Washington, D. C., $9,797; twenty days.

C. R. Monroe, Washington, D. C., $5,400; twenty-one days (*accepted*).

D. J. McCarty, Washington, D. C., $6,990; forty-two days.

Frank Baldwin, Washington, D. C., $9,400; thirty week days.

A. G. Pumphrey, Washington, D. C., $10,500; forty days.

Thomas J. King, Washington, D. C., $8,483; thirty days.

Maxley Anderson, Washington, D. C., $8,440; thirty days.

COMPETITIONS.

CITY-HALL.

[At Richmond, Va.]
February 16, 1885.

Proposals are invited **until June 1st, 1885,** for furnishing designs for a city-hall upon which premiums will be paid as follows: —

For first best design, $700.

For second best design, $300.

The Committee on Grounds and Buildings of the City Council reserves the right to reject any and all designs.

For information address the undersigned.

487 W. E. CUTSHAW, City Engineer.

STATE-HOUSE.

[At Denver, Col.]

State of Colorado,
Office of the Board of Capitol Managers,
Denver, April 16, 1885.

In pursuance of an Act of the Fifth General Assembly of the State of Colorado, entitled "An Act to provide for the erection of a State Capitol Building at the City of Denver, and creating a Board of Management and Supervision, and appropriating funds therefor," plans and specifications for a Capitol building which, when erected, shall not cost to exceed one million of dollars, will be received by the Board of Managers **until 12 o'clock meridian, on the tenth day of July, 1885.**

The said Capitol building will be erected upon the summit of a plat of ground in the city of Denver, State of Colorado, known as Capitol Hill, with its principal façade to the west. The length of said building to be about 300′, and no plans will be considered for a building that are over 310′ in length. The breadth, height and general form must be in such proportion to its length as to constitute a symmetrical building, and must be constructed with special regard to strength and durability. The facing and ornamentation of the superstructure, including cornices, pediments and ballustrades, will be of stone.

Drawings must consist of foundation, sub-basement, basement, or first, second or third story plans, roof plans, and section of same, longitudinal section, transverse section, front, rear and end elevations, dome plan, giving section of same and material used, and method of construction from base to summit. Also giving diameter or area of base, style of architecture and extreme elevation.

The said Capitol building shall be built of stone, brick and iron, as far as practicable, and of material found in the State of Colorado, provided the same can be found in said State as cheaply as other materials of like quality in other localities. The entire building must be made as nearly as possible fireproof. The laws of acoustics must be carefully observed. The materials used in said building must be of the best quality. Provision must be made for steam-heating apparatus, and for the drainage, lighting and ventilation of said building in the most approved manner; and such a number of fireproof vaults as may be necessary for the preservation of the books and papers of the various departments of the State Government; also for elevators, water closets, etc.

All plans and scale drawings must be put on wooden frames or stretchers in order that they may be convenient for examination, and on a scale of one-eighth of an inch to one foot.

Compensation for plans and specifications will be as follows: For the best set of plans and specifications the sum of $1,500; for the second, $1,000; for the third, the sum of $800. All plans and specifications for which money is paid shall become the property of the State. The architect whose plans are adopted will be required to furnish the same in duplicate. For the detailed working plans and supervision, the amount shall not exceed two and one-half per cent of the cost of said building. No plan will be adopted until it shall be definitely ascertained that the entire cost of said Capitol building shall not exceed the sum of $1,000,000.

Said building must contain the following rooms, and such other rooms as convenience and symmetry require:

The sub-basement shall be eight feet between joists, and adapted to the use of the machinery, etc., of the building.

The basement story to be not less than fourteen feet between joists, and extend twelve feet above the surface of the surrounding ground. Said basement story to be divided into rooms to be used for the Adjutant-General's quarters, Historical Society, Horticultural Society, State Geologist and Mineral Cabinet, Commissioner and Inspector of Mines, and Storage Rooms.

First, or principal office story, to be not less than twenty feet between joists, and to contain, as near as practicable, the following rooms, to wit:

Three rooms for the Governor.

Same for Secretary of State.

Three rooms for Auditor of State.

Same for State Treasurer.

Two rooms for Insurance Department, two rooms for Attorney-General, three rooms for State Engineer, three rooms for Railroad Commissioner.

Four rooms for State Board of Land Commissioners, three rooms for Superintendent of Public Instruction.

Second, or double story, to be not less than forty-two feet between joists. The Senate Chamber, Hall of House of Representatives, Supreme Court Room and State Library to be of full height, other rooms to be approximately half of said height.

One Senate Chamber, with lobbies and galleries of appropriate dimensions, to accomodate fifty Senators; one room for Lieutenant-Governor and President, one room for Secretary of Senate, one Post-office, one Stationery and Bill room, one Sergeant-at-Arms room, cloak room, lavatory and closets; two rooms for Engrossing Committee, two rooms for Enrolling Committee, and not less than ten other appropriate committee rooms for use of Senate.

One hall for House of Representatives, with lobbies and galleries of appropriate dimensions, to accomodate one hundred members; one room for Speaker of the House, one room for Chief Clerk of House, one Post-office, one Stationery and Bill room, one Sergeant-at-Arms room, cloak room, lavatory and closets, two rooms for Engrossing Committee, two rooms for Enrolling Committee, and not less than ten other appropriate committee rooms for the use of House of Representatives.

One State library room, one Librarian's room, and ten committee rooms.

One Supreme Court room, one law library room, one Clerk of Court room, one Marshal of Court room, one consultation room, six judges' private rooms, with fireproof vaults, lavatory and closets attatched.

Public lavatory and closets on each floor of said building.

The drawings must be sent to the "Board of Capitol Managers," Denver, Colorado, and be endorsed "Plans for State Capitol Building," and must come under a *nom de plume*, the real name and address to be sent to the Board of Managers in a sealed envelope, marked "private," which will not be opened until after the award is made.

The Board reserves the right to reject any and all plans.

For further information apply to

BOARD OF CAPITOL MANAGERS.

Geo. T. Clark,
Secretary. P. O. Box, 2291.

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PROPOSALS.

EXTENSION OF TIME.

NOTICE TO BIDDERS.

Office of Supervising Architect,
Treasury Department,
Washington, D. C., April 21, 1885.

Bidders are hereby notified that the time for opening the bids for the masonry of the basement and superstructure of the post-office, etc., building at Brooklyn, N. Y., is **extended until 2 o'clock, P. M., April 30th, 1885.**

M. E. BELL,
487 Supervising Architect.

JAIL AND HOUSE OF CORRECTION.

[At Springfield, Mass.]
Office of the Commissioners of the County of Hampden,
State of Massachusetts.

Sealed proposals for the erection and completion of a jail and house of correction for the County of Hampden, to be located on York Street, in the city of Springfield, Massachusetts, will be received by the undersigned, Commissioners of said County, at their office, **until Tuesday, May 12, 1885.**

Plans and specifications can be seen at the office of D. H. & A. B. Tower, Architects, at Holyoke, Mass., on and after Thursday, April 16, 1885.

The builders to whom the contract shall be awarded will be required to enter into bonds, with at least two approved sureties, for the sum of $35,000, for the faithful performance of the contract.

Bidders will be required to send certified check for the sum of $500 with proposals.

Work to be commenced within 20 days of awarding of contract, and to be finished on or before the 15th day of November, 1886.

The right reserved to the Commissioners to reject any or all bids.

LEONARD CLARK,
HENRY A. CHASE,
L. F. ROOT,
Commissioners of the County of Hampden.

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STEAM-HEATING, PLUMBING, WATER-WORKS AND TUNNELS.

[At Logansport, Evansville, and Richmond, Ind.]

Sealed proposals will be received at the office of the Governor of Indiana, **between the hours of 10 and 11 o'clock, A. M., Saturday, May 30, 1885,** for the following classes of equipments for the Northern, Southern and Eastern Indiana Hospitals for Insane, located respectively at Logansport, Evansville, and Richmond: —

Class 1. For each hospital, four steam generators, one hundred horse-power each.

Class 2. For each hospital, steam-heating apparatus, fifteen thousand to twenty-two thousand square feet of radiating surface.

Class 3. For each hospital, sanitary fixtures and plumbing.

Class 4. For each hospital, pumping-engines.

Class 5. For each hospital, water-supply system.

Class 6. For the Northern Hospital, system of pipe-tunnels.

Specifications (and drawings, where required) of the above work may be seen at the office of E. H. Ketcham, Architect, at Indianapolis, and additional information may be had of Dr. Jos. G. Rogers, Medical Engineer, at Logansport, on and after April 24, 1885.

Separate bids will be required for each class of work, for each hospital, and each bid must be accompanied by a guaranty bond, with two or more resident freeholder sureties, in five per cent of the amount of the bid.

The Board of Commissioners for the Additional Hospitals for Insane reserves the right to reject any or all bids.

Bidders on Class 1 will be required to furnish, with bids, complete and full specifications and drawings.

All bids on any class of work must be accompanied by a full and complete itemized schedule of quantities and prices, the sum of which must equal the amount of the bid.

ISAAC P. GRAY,
489 Governor and Pres. Board of Commissioners.